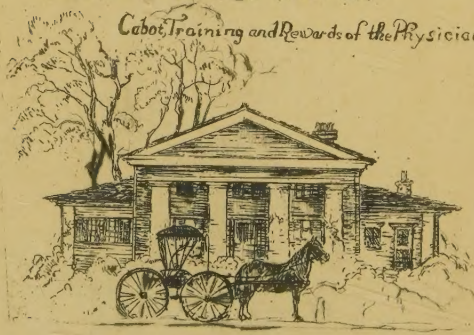
A GUIDE TO THE TREES

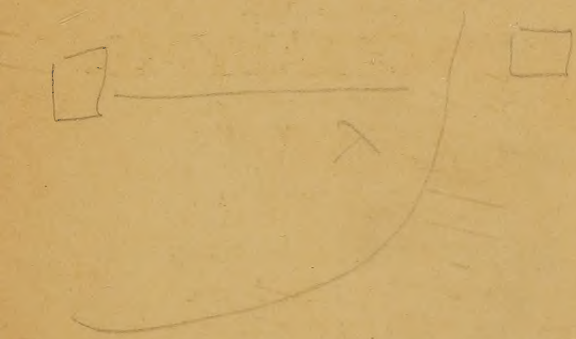
CARLTON C. CURTIS

GIFT OF
R.J.M.CREADY,M.D.

"It keeps us supple in Mind and Spirit to use every Faculty that we possess, to take in at every Pore the typical human Experiences as we meet them."

Cabot, Training and Rewards of the Physician.





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BY

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To Jack and Mary and Their
Companions in the out of
doors, wherever they may be

INTRODUCTION

EVERY one should know the trees of his neighborhood. Nothing adds more attractiveness to the country or gives more benefit and enjoyment to the people. If one could see lands that have been stripped of their forests the truth of this statement would be apparent. Many places in the old countries of the East, and indeed some sections of our own country, have been transformed from beautiful and fertile fields into barren and repulsive regions by the removal of the forests.

Not only are the trees themselves a great loss, but the fertility of the soil goes with them. The trees are the great conservers of water. The soft earth with its carpet of leaves permits the rains to settle down slowly into the ground, and this water supplies the brooks and rivers. With the removal of the trees the ground becomes hard; the rains do not penetrate the soil, but run off quickly over the surface of adjacent fields. This results in carrying away the top-soil of these fields and making them unfertile; it also causes the springs and brooks gradually to dry up, which means a loss to all the surrounding country.

It is only within the past few years that we have begun to realize what the forests mean to our country. With the rapid increase of the population it is necessary that something be done to prevent the wasting of land; and to preserve and enlarge our forests, if we are to have places where the out-of-doors can really be enjoyed.

Our North American forests were once the finest to be found in any temperate country. No other region

had such a variety of valuable and beautiful trees; no other land is so favorable to their growth. Originally the United States alone had over eight hundred million acres of forest. Today less than one hundred and thirty million acres remain untouched, and half of this is on the Pacific coast. This remnant is being consumed so fast that the end is in sight. It is reported that a single issue of a Sunday paper requires the destruction of fifty-four acres of timber. One might well ask, which is mightier, the pen or the ax? Our forests have been in continuous possession of the country from a time long antedating the appearance of man upon the earth; and we are destroying this inheritance four times faster than it is being produced. A large forest tree that is cut down and converted into paper in a few days' time may take one hundred years to grow.

But the fact that trees cannot be grown quickly should not prevent our going forward with the work of reforesting. The Forestry Service estimates that we have in the United States over four hundred million acres of land suitable only for forests, eighty-one million acres of which is east of the Mississippi River. Every state has thousands of acres of such land, which if properly managed would meet our needs for all time. Some towns of Europe own and utilize such tracts for forestry purposes and derive a revenue from them that meets all expenses, so that the people are free from taxation.

In every section there are attractive and useful plants now threatened with extinction. This is due to the ignorance of people and their consequent thoughtlessness. If one really comes to know a tree he will have a respect for it. It has a personality as striking as his own and is in many ways more sensitive to the treatment it receives. It is less brutal and harmful to tear out a handful of hair from a person's head than to tear off the branches from a tree; such treatment endangers

the life of the tree or prevents it from reaching its full growth. If one must remove any part of a plant it should be done with a sharp knife. Also remember that one or two sprays reflect more beauty than an armful or a carful; furthermore you escape the disgrace of being seen with the slaughter.

Those who really love the out-of-doors prefer to leave growing things where they can flourish and where other people can enjoy them. Every one can be of service in helping to remedy this unfortunate situation; and it is encouraging to note that the spirit of fairness and appreciation is decidedly growing.

The influence of the Scout movement among the boys and girls of our country cannot be overestimated in promoting a spirit of good citizenship and good sport in the use and enjoyment of the woods and fields. This outline has been prepared to acquaint them with our inheritance and to put them in sympathy with maintaining it; and also to enable them to use the numerous and more extensive books dealing with this subject.

No work can be undertaken that will be of greater benefit to you than this work of identifying your trees. It develops a keenness of observation and a power of judgment as no other subject does. John Stuart Mill took up work of this nature as part of his training for his work in economics.

You will at first be amazed at your inability to see and to form a correct judgment. You are dealing with living things that show almost endless variations. Acquiring the power to see clearly and accurately these features and to give them due weight is a training that will be of the greatest assistance to you in any work that you undertake.

A few of the books referred to above are given in the following list. All of them are illustrated.

Britton. North American Trees. Holt & Co., N. Y.

Britton & Brown. Flora of North Eastern America. Scribner's, N. Y.

Gray's Manual of Botany. American Book Co., N. Y.

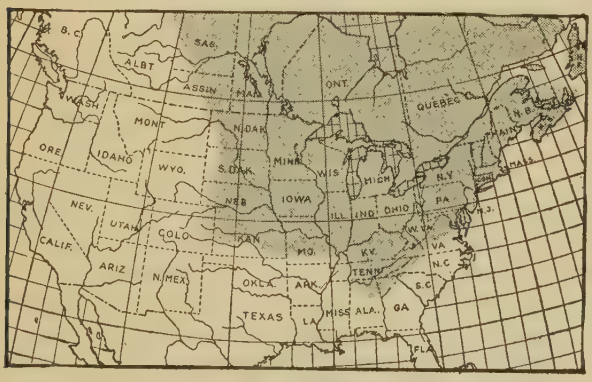
Hough, R. B. Trees of Northern States and Canada. Lowville, N. Y.

Mathews. Field Book of American Trees and Shrubs. Putnam, N. Y.

Sargent. Manual of North American Trees. Houghton, Mifflin & Co., N. Y.

EXPLANATIONS AND SUGGESTIONS

1. **The area covered in this guide** is the shaded section on the map shown below. The native (uncultivated) plants found here comprise what botanists term the flora of northeastern North America, as indicated in Prof. Britton's and Prof. Sargent's books (see page 4). Some trees are found in only a small section of this area. In such cases their distribution is indicated after the description of the tree. A few shrubs that every one wishes to know are included also.



SHADED AREA SHOWS LOCALITY OF TREES DESCRIBED IN THIS BOOK

2. **The names of trees vary** in different sections of the country. Frequently a tree is burdened with several names; or, still worse, the same name is applied to entirely different trees. The American Committee on Horticultural Names has tried to remedy this con-

fusion by selecting the most appropriate name for each kind of tree. Their selections have been used in this guide. Following the name of a tree is the Latin name in parenthesis, thus: Silver Maple (*Acer saccharinum* L.). The letter or letters after the Latin name stand for the author's name; in this case Linnæus. The Latin name is introduced so that one can refer to the more extended books in which the Latin names are used in preference to the English.

It will be noticed that the name of a tree sometimes appears in more than one place in the key. This is due to their wide variations. For instance, the oaks are a large group and have a great variety of leaves. Again a tree is "keyed out" in two places if the statements by which it is identified may be differently interpreted.

3. **Where fruits are used in the key** for identifying a tree, these with very few exceptions can be found at any time of the year either on the tree or on the ground.

4. **Buds are frequently not satisfactorily developed** until after midsummer. When you are keying out a tree in the early summer and bud characters are required to identify it, you can generally find well developed buds on a twig that has died the previous winter. However, if no buds are available, you will notice that in the key one of the divisions under bud characters includes but two or three trees. A glance at the illustrations will show you whether they include the specimen that you are examining.

5. **A few words are defined on page 198.** These are common English words but may not as yet be familiar to all who use this guide. No strictly technical words are used. Illustrations of the shapes of leaves are also given in this connection.

6. **No two leaves of a tree are exactly alike.** This is the cause in part of the attractiveness of the tree. But each tree has a definite leaf-shape or pattern, which

can be found by making a careful examination of the various forms and picking out the one that is most representative. This is not always an easy thing to do. If two or more persons are engaged in the task there is sure to be an argument. This difference of opinion is most helpful in developing judgment and power of observation, and it is sure to result in the selection of a representative type of leaf.

The person who cannot observe these precautions must abandon the work, for he will make no progress in this line of study—or indeed in any other. If he is not willing to do more than examine the first leaf within reach, let him close the book and go home—or to the movies.

7. **If the leaf is irregular or lobed** the form of the leaf can best be understood by finding out which of the figures on page 198 most nearly completely covers it. This figure will then represent the form or shape of the leaf.

8. **To make a proper selection,** choose a leaf from a tree or branch as mature and well sunned as possible. Young shoots and shaded branches rarely bear typical leaves. Remember also that young leaves may be quite different from mature ones. The descriptions of leaves in the following pages are based on full-grown leaves.

9. **In examining the bark,** you will note that young trees have nearly smooth bark, but in the majority of mature trees the bark becomes cracked into scales or ridges that are characteristic of each kind of tree. Therefore you must examine the trunk of an old tree, best seen two or three feet from the ground, to find the kind of bark mentioned in the key. In the younger growth of an old tree, that is in the upper part of the trunk or branches, you will, of course, find smooth bark like that of a young tree.

The color of the twigs also assists in identifying a tree. The color varies with the life of the twig, being

often quite different in the spring, summer, and fall, as well as with its later growth.

10. **From the variations of leaves and bark** you are not to conclude that you cannot arrive at an exact knowledge of the trees. You will come to know them and their peculiarities much more certainly than the identity of your friends.

11. **The dimensions given in this book** of a leaf, fruit or tree represent averages. They give you a general idea of the size, not the exact size, for there is no such thing. Feet and inches are indicated thus: 4° 6′ (four feet six inches). A five-inch rule is printed on the inside cover of the book.

12. **If a twig must be removed** from a tree, remove it with a clean cut of a sharp knife. Never tear off a twig or branch.

13. **A pocket magnifying glass** is of the greatest assistance in observing many features about leaves, buds and other parts of the tree. It also reveals many interesting and beautiful things that cannot be seen with the naked eye.

14. **Many people are poisoned** by touching two plants mentioned on page 150. So before beginning the field work, study these plants and learn to avoid them.

HOW TO USE THE KEY

SUPPOSE that you have selected a leaf (as directed on page 7) which is like the one shown in the figure below (Fig. 1). To find the name of this tree turn to the key on page 11. If you do not know the meaning of a word in the key, turn to definitions, page 198.

FIG. 1

You will find in the key two main groups: I, The Cone-Bearing Trees, leaves *needle-like* or *scale-like* (Figs. 2, 3, 4), and II, The Broad-Leaved Trees, leaves *broad* and *flat* (Figs. 5, 6, 7). Comparing your leaf with these two statements and the figures under them, you see that your leaf belongs to The Broad-Leaved Trees. You are directed to page 12 where the Broad-Leaved Trees are keyed out. All your work with the key will be of this nature; you are asked to choose between two statements, or in a few cases between more than two. Contrasting statements always begin at the same distance from the margin of the page, and if they are widely separated from each other by intervening lines they are lettered (*a, aa; b, bb, etc.*) so as to point them out more clearly. Read both statements in order to make a correct choice.

On page 12, under The Broad-Leaved Trees, you find again two headings: A, Leaves *opposite* (Fig. 9) and B, Leaves *not opposite* but *alternating* (Fig. 10). Here, from the figures below these lines and your specimen you know that your tree has alternating leaves, and you turn to page 14. You now choose between the two statements: 1, Leaves *simple* (Fig. 16) and 2, Leaves *not simple* but *compound* (Fig. 15). The illustrations tell you that your leaf is simple, and you are directed to look below. Here you read: 1*a*, Leaf *margin smooth* (Fig. 16) and 1*b*, Leaf *margin toothed* (Fig. 17). The figures cause you to select "Leaf margin toothed," and you are directed to page 17. Here you choose between *Juice milky* and *Juice not milky*. By cutting a twig you learn that your specimen has watery juice (not milky). Under "Juice not milky" you have to decide between *a*, Branches *with spines* and *aa*, Branches *without spines*. You must examine the branches carefully, for in some trees there are sometimes only a few spines developed. In the case of your tree there are no spines; and under the heading "Branches of tree without spines" you choose between *b, Large veins spreading from the petiole* (Fig. 22) and *bb, Large veins mostly spreading from the middle vein* (Fig. 24). The figures in the key lead you to the first statement, and under this you find two headings: *c*, Leaves *with lobes* (Fig. 22) and *cc*, Leaves *without lobes* (Fig. 23). Your leaf is clearly lobed, and under this heading you have three statements describing three kinds of leaves. You see that the second one corresponds with your leaf, and this brings you to the Sycamore. You are now directed to page 126, where you read the full description and find that it agrees with the tree that you are examining. You have become acquainted with your first tree.

GENERAL KEY

Before attempting to use the key read pages 5 to 10.

The two main groups of Trees.

I. The Cone-Bearing Trees.

Leaves needle-like or scale-like. Fruit a cone or rarely a bluish berry. See Figs. 2, 3, 4. See below.

FIG. 2

FIG. 3

FIG. 4

II. The Broad-Leaved Trees.

Leaves broad and flat. See Figs. 5, 6, 7. See p. 12.

FIG. 5

FIG. 6

FIG. 7

I. The Cone-Bearing Trees.

A. Leaves mostly clustered at ends of short twigs; soft slim needles. See Fig. 8. *Larch.* (p. 33).

FIG. 8

B. Leaves not clustered at ends of short twigs but scattered along the branchlets. See Figs. 2, 3 and 4.

a. Leaves projecting from the twigs; not opposite or whorled. See Figs. 2 and 3.

b. Leaves long slender needles in groups of 2, 3, or 5. See Fig. 2. *Pine.* p. 24.

bb. Leaves short needles; not in groups. See Fig. 3.

c. Leaf with short stem, twig rough after leaf-fall.

Leaf flat, blunt, notched at end. *Hemlock.* p. 39.

Leaf four-sided, sharp at end. *Spruce.* p. 35.

cc. Leaf without stem, twig smooth after leaf-fall.

Bark grayish, nearly smooth. *Fir.* p. 40.

Bark reddish brown, slightly ridged. *Baldcypress.* p. 41.

aa. Leaves usually pressed against twigs; opposite or three in a whorl. See Fig. 4.

b. Twigs flattish.

Cone cylindrical, twigs strongly flattened. *Arborvitæ.* p. 42.

Cone roundish, twigs slightly flattened. *Whitecedar.* p. 43.

bb. Twigs square or rounded, fruit berry-like. *Juniper.* pp. 44-5.

II. The Broad-Leaved Trees.

A. Leaves opposite. See Fig. 9. See p. 13.

B. Leaves not opposite but alternating. See Fig. 10. See p. 14.

FIG. 9

FIG. 10

A. Leaves opposite.

1. *Leaves simple, not composed of several leaflets.* See Fig. 11. See below.
2. *Leaves not simple but composed of several leaflets (compound).* See Fig. 12. See p. 14.

FIG. 11

FIG. 12

1. *Leaves simple.*

Leaves with large veins spreading from the petiole. See Fig. 13.

Leaves lobed. *Maple.* See Fig. 13. p. 159.

Leaves not lobed. *Catalpa and Paulownia.* pp. 191-2.

FIG. 13

FIG. 14

Leaves with large veins mostly spreading from the middle vein. See Fig. 11.

a. Leaf margin smooth (toothless). See Fig. 11.

Leaves ovate to lanceolate, 2′-6′ long. *Button-bush.* p. 192.

Leaves usually elliptical or obovate.

Leaves mostly blunt-pointed, leathery, rusty beneath. *Viburnum.* p. 194.

Leaves sharp-pointed.

Leaves 1′-2′ long. *Privet.* p. 196.

Leaves 2′-4′ long. *Dogwood.* pp. 174-5.

Leaves 4′-8′ long. *Fringetree.* p. 189.

aa. Leaf margin toothed. See Fig. 14.
Leaves ovate, obovate or rounded. *Viburnum,* p. 194
Leaves elliptical.
Leaves fine-toothed, hairy beneath. *Burning-bush.* p. 157.
Leaves blunt-toothed, smooth beneath. *Adelia.* p. 189.

2. *Leaves not simple but composed of several leaflets (compound).*

Leaves with large veins extending to the teeth.
Leaf composed of 5-7 leaflets. *Buckeye.* p. 166.
Leaf composed of 3-5 leaflets. *Boxelder.* p. 159.
Leaves with large veins not extending to the teeth but branching and uniting within the margin.

Teeth rounded or nearly lacking. *Ash.* p. 184.
Teeth sharp.
Leaf of 3 leaflets. *Bladdernut.* p. 157.
Leaf of 5-11 leaflets. *Elderberry.* p. 193.

B. Leaves not opposite but alternating.

1. *Leaves simple (not composed of several leaflets).* See Fig. 16. See below.
2. *Leaves not simple but composed of several leaflets (compound).* See Fig. 15. See p. 22.

FIG. 15

FIG. 16

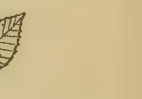


FIG. 17

1. *Leaves simple.*

1*a.* Leaf margin smooth (toothless). See Fig. 16. See p. 15.
1*b.* Leaf margin toothed. See Fig. 17; also p. 17.

1a. Leaf margin smooth.

a. Branchlets spiny.
Pith orange colored. *Osage Orange.* p. 117.
Pith not orange colored. *Bumelia.* p. 180.
aa. Branchlets not spiny.
b. Juice milky or gummy. *Bumelia.* p. 180.
bb. Juice not milky.
c. Twigs and leaves spicy.
Twigs shining green. *Sassafras.* p. 123.
Twigs brownish. *Spicebush.* p. 124.
cc. Twigs and leaves not spicy.
d. Buds not covered with overlapping scales. See Fig. 18.
Leaves long and narrow, buds flattened against twigs. *Willow.* p. 55.
Leaves large and broad, buds not flattened against twigs.
Leaf with broad notch at end. *Tulip Tree.* p. 122.
Leaf pointed at end. *Magnolia.* p. 118.
dd. Buds covered with overlapping scales. See Fig. 19.

FIG. 18

FIG. 19

e. Large veins mostly spreading from petiole. See Fig. 20.
Leaf with 5 large veins. *Redbud.* p. 143.
Leaf with 3 large veins. *Sugarberry.* p. 114.

ee. Large veins mostly spreading from middle vein. See Fig. 21.

FIG. 20

FIG. 21

f. Leaves with sharp tip.

Leaves ovate to elliptical. *Dogwood.* p. 174.

Leaves oblong, obovate to oblanceolate.

g. Bark of trunk rough.

Bark scaly or ridged; fruit an acorn. *Oak.* p. 92.

Bark ridged in angular plates; fruit cherry-like. *Tupelo.* p. 173.

gg. Bark of trunk smoothish.

Large trees; fruit an acorn. *Oak.* p. 92.

Small tree or shrubs.

Leaf thin, 10′-12′ long. *Pawpaw.* p. 123.

Leaf thick and leathery.

Leaf 3′-4′ long. *Laurel.* p. 178.

Leaf 4′-12′ long.

Rhododendron. p. 177.

ff. Leaves with blunt or rounded tip.

Juice resinous, unpleasant odor. *Smoke-tree.* p. 149.

Juice watery.

Fruit a small, woody pod; leaf roundish. *Witch-hazel.* p. 124.

Fruit an acorn, leaf not roundish. *Oak.* p. 92.

1*b*. *Leaf margin toothed.*

Juice milky.

Leaves smooth or roughish above. *Mulberry.* p. 115.

Leaves harshly rough above. *Paper Mulberry.* p. 116.

Juice not milky.

a. Branches of tree or some of them with spines.

Thorns on sides of long branches. *Thorn.* p. 135.

Thorns at ends of short, rough twigs.

Teeth of leaf blunt or lacking. *Buckthorn.* p. 169.

Teeth of leaf sharp.

Buds blunt, often hairy. *Pear. Apple.* pp. 128-9.

Buds pointed, smooth. *Plum.* p. 136.

aa. Branches of tree without spines.

b. Large veins spreading from petiole. See Fig. 22.

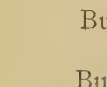


FIG. 22

FIG. 23

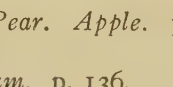


FIG. 24

c. Leaves with lobes.

Lobes narrow; fine-toothed; leaf starlike. *Sweetgum.* p. 125.

Lobes broad; coarse-toothed; leaf roundish. *Sycamore.* p. 126.

Lobes short; blunt-toothed; leaf ovate. *Poplar.* p. 47.

cc. Leaves without lobes. See Fig. 23.

d. Leaves broadly ovate, roundish or triangular.

Leaves thin, sharp-toothed. *Linden.* p. 170.

Leaves firm, blunt-toothed. *Poplar.* p. 47.

dd. Leaves ovate.

Fine-toothed, even at base. *Jersey-tea.* p. 170.

Coarse-toothed or smooth, usually uneven at base. *Sugarberry.* p. 114.

bb. Large veins mostly spreading from middle vein. See Fig. 24.

c. Buds not covered with overlapping scales. See Fig. 18.

Leaves usually long and narrow. *Willow.* p. 55.

Leaves broad-ovate to obovate. *Alder.* pp. 87-8.

cc. Buds covered with overlapping scales. See Fig. 19.

d. Leaves with large veins extending to the teeth. See Fig. 17.

e. Bark of trunk smooth (not ridged, sometimes cracking).

f. Small trees or shrubs.

Leaf very uneven at base. *Witch-hazel.* p. 124.

Leaf even at base or nearly so.
Leaves aromatic. *Myrica.* pp. 67-8.
Leaves not aromatic.
Bark slate-gray with muscle-like swellings. *Hornbeam.* p. 80.
Bark russet to dark brown.
Leaf base heart-shaped. *Hazelnut.* p. 81.
Leaf base narrow or rounded. *Clethra.* p. 176.

ff. Large trees.
Bark light steel-gray. *Beech.* p. 88.
Bark red-brown, yellowish or white. *Birch.* p. 83.
Bark brown or greenish brown; fruit an acorn. *Oak.* p. 92.

ee. Bark of trunk rough (scaly or ridged).

f. Large branches ending in coarse, stiff twigs.
Buds several at end of twig; fruit an acorn. *Oak.* p. 92.
Buds one at end of twig.
Leaves oblong to lanceolate. *Chestnut.* p. 89.
Leaves ovate to roundish. *Linden.* p. 170.

ff. *Large branches ending in slender twigs.*

Bark ridged, branches often drooping. *Elm.* p. 109.

Bark in thin large scales. *Water Elm.* p. 113.

Bark in thin narrow scales. *Hophornbeam.* p. 81.

Bark in papery strips or coarse plates. *Birch.* p. 83.

dd. Leaves with large veins not extending to the teeth, but branching and uniting within the leaf margin. See Fig. 25.

Fig. 25

e. Leaves broadly ovate, triangular or roundish. *Poplar.* p. 47.

ee. Leaves elliptical, lanceolate, oblong or obovate.

f. Bark of trunk smooth (or slightly ridged but not scaly ridged).

g. *Bark smooth.*

Bark with vertical stripes. *Shadblow.* p. 133.

Bark with horizontal stripes. *Cherry.*

Plum. Peach. pp. 135-6.

Bark without stripes, sometimes minutely warty.

Teeth of leaf few or indistinct or lacking. *Ilex.* p. 154.

Teeth of leaf numerous, fine, sharp. *Chokeberry.* p. 132.

See here also certain forms of *Shadblow.* p. 133.

gg. Bark slightly ridged.

Bark reddish brown with tan-colored vertical stripes. *Silverbell.* p. 181.

Bark light gray or brown.

Bark with ridges widely separated; leaf sweetish. *Sweetleaf.* p. 182.

Bark often black-blotched. *Buckthorn.* p. 169.

ff. Bark of trunk rough ridged.

Ridges deep, rounded; leaf sour. *Sourwood.* p. 178.

Ridges shallow, broad, flat. *Silverbell.* p. 181.

Ridges narrow, scaly, or smooth. *Shadblow.* p. 133.

See here also certain forms of *Crab Apple.* p. 129.

fff. Bark of trunk in rough scales or plates.

g. Bark in thick, squarish blocks. *Persimmon.* p. 181.

gg. Bark in irregular or oblong thin scales or plates.

Trees of wet soil. *Farkleberry.* p. 179.

Trees of drier soil. *Pear. Apple.* pp. 128-9.

ggg. Bark in coarse plates or out-turned scales; horizontal lines on branches. *Peach. Plum. Cherry.* pp. 135-6.

2. *Leaves not simple but composed of several leaflets (compound).*

Branches and twigs generally spiny.

Spines at base of petiole. *Locust.* p. 146.

Spines scattered on stems and branchlets.

Spines large. *Honeylocust.* p. 143.

Spines small.

Leaflet ovate to oblong; teeth few. *Prickly-ash.* p. 147.

Leaflet ovate; teeth many. *Aralia.* p. 172.

Branches and twigs not spiny.

Leaves composed of 3 leaflets. *Hoptree.* p. 147.

Leaves composed of more than 3 leaflets.

Juice milky. *Sumac.* p. 150.

Juice not milky.

Leaves aromatic when crushed.

Pith chambered. *Walnut.* See Fig. 26. p. 69.

Pith solid. *Hickory.* See Fig. 27. p. 72.

FIG. 26

FIG. 27

Leaves not aromatic when crushed.

Leaf margin smooth.

Leaflets opposite. *Coffeetree.* p. 144.

Leaflets mostly alternate. *Yellow-wood.* p. 145.

Leaf margin toothed.

Leaflet toothed only at base. *Ailanthus.* p. 148.

Leaflet toothed at upper end. *Mountain Ash.* p. 127.

THE CONE-BEARING TREES

PINE (*Pinus L.*)

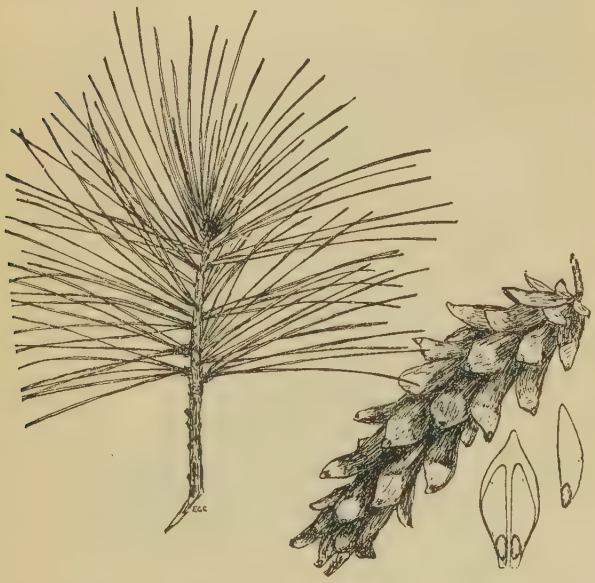
This extensive group includes some of our largest and most valuable forest trees, and no other group contains so many attractive forms. They are characterized in most cases by their straight stems, large spreading branches (short as compared with the length of the stem) and resinous juice. The bark is usually thick and scaly ridged. The leaves are long, slim needles arranged in clusters of two to five. Each cluster is surrounded at the base, for a time at least, with minute thin scales. The flowers are of two kinds, arranged in cones. The pollen-bearing cones are small and are composed of overlapping scales. They are grouped at the end of the twigs (see No. 3, below) and appear in the spring, dropping off after a few weeks. The seed-bearing cones are solitary or in clusters of two or more, and have thicker overlapping scales. These cones in the spring are very small but continue to grow, becoming large brownish cones with thick woody scales that are often spine-tipped. In some kinds this development requires only a year; in other varieties two or even three years. A scale of the cone usually covers two winged seeds (see No. 1, below). The scales curve outwards when the seeds are shed, making the cones much larger. There are in our range eight varieties of Pines.

Key to the Species of Pines.

Leaves in clusters of five. 1. White Pine.
Leaves in clusters of three.
  Leaf 6′-10′ long. 2. Lobolly Pine.
  Leaf 2′-5′ long. 3. Pitch Pine.
Leaves in clusters of three and two. 4. Yellow Pine.

Leaves in clusters of two.
Cones curved, leaf about 1′ long. 5. Jack Pine.
Cones straight.
Scales of cone without spines. Leaf 4′-6′ long.
6. Red Pine.
Scales of cones with spines. Leaf 1.5′-3′ long.
Spines of cone slender. 7. Scrub Pine.
Spines of cone stout. 8. Table Mountain Pine.

1. **White Pine** (*P. Strobus L.*). This is the finest northern pine. The stem is frequently 100° high and occasionally over 200°. The plume-like branches are arranged in regular whorls on the trunk, and sweep

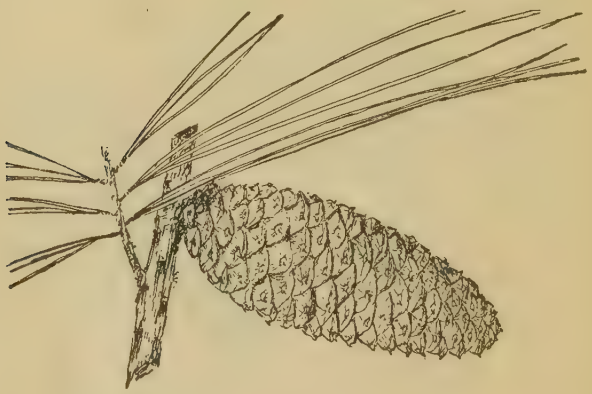


upwards in graceful curves forming a somewhat cylindrical top. The young twigs are slightly hairy, becoming smooth and greenish with yellow brown tinge. The bark on young stems is smooth, greenish

red; on old trunks it cracks into broad reddish or grayish-brown scaly ridges. The leaves are in clusters of five; slender, flexible, angled, light or dark bluish green, 3′-5′ long. The cones are cylindrical, 4′-8′ long, scales thin at tip, spineless. Its range is from Canada southward, along the Alleghanies to Georgia and westward to Iowa.

The White Pine is the finest timber tree in the world. It once formed vast forests from New Brunswick through Canada and the Lake States to Minnesota. These are now destroyed and will not perhaps be used for extensive forest planting because of the danger from the White Pine Blister.

2. **Loblolly Pine** (*P. Taeda L.*). This is a tree 80°-100° high, with wide-spreading branches forming a somewhat roundish top. The twigs are smooth and brownish yellow. The bark on old trunks is broken



into shallow, broad, flat, red-brown, scaly ridges or plates. The leaves are in clusters of three (rarely two) slender, stiff, three-sided and often twisted, light green, 6′-10′ long. The cone is long-ovoid, reddish

brown, 2′-6′ long; scales tipped with short, straight or curved spines. Its range is from southern New Jersey southward. It grows rapidly and will be used in reforestation.

3. **Pitch Pine** (*P. rigida Mill.*). A small tree 40°-60° high with short trunk. The branches are coarse, rough, often twisted and beset with many old cones. The twigs are bright green, changing to yellow-

brown and finally to gray-brown. The bark on old trunks is cracked into broad, flat, deep ridges, covered with thick, dark red-brown scales. The leaves are in clusters of three, three-sided, spreading stiffly at right angles to the twigs; dark green, 2′-5′ long. The cones are ovoid, almost round when opened, light brown, 1′-3′ long; scales with slender, generally curved spines. This is a common tree on poor soil, from eastern Canada to Ontario southward.

4. **Yellow Pine** (*P. echinata Mill.*). A somewhat round-topped tree, 80°-100° high. The branchlets and

twigs are very brittle; at first greenish violet and covered with a waxy coating, becoming dark red-brown. The bark on the branches cracks into large scales and on old trunks is broken into large irregular scaly plates

of a reddish or grayish color. The leaves are in clusters of two and three, slender, dark blue-green, 3′-5′ long. The cones are generally in clusters, dull brown and about 2′ long; the scales tipped with nearly straight spines that soon drop off. It is a valuable timber tree, ranging from southern New York to Illinois and southward.

5. **Jack Pine** (*P. Banksiana Lamb.*). A small northern tree, with wide-spreading slender branches forming an open symmetrical top. It often becomes stunted, however, and very irregular. The twigs are yellow green, becoming dark purplish brown. The bark on old trunks cracks into a shaggy network of thick, scaled ridges or plates, of a dark brown or slightly reddish color. The leaves are two in a cluster, generally growing in bunches at intervals along the

twigs. They are stiff, flattish, dark green, and about 1′ long. The cones are uneven at the base and generally curved, shining yellow brown 1′-2′ long. The

scale is usually spineless and much thickened at the tip. It is found from northern Maine throughout Canada and the Lake States.

The Scotch Pine (*P. sylvestris L.*) is a similar much cultivated tree which has escaped locally along the New England coast. As usually seen it is a small tree with irregular trunk and branches, tho it is sometimes 60°-80° high. The twigs are yellowish, becoming grayish; the bark brownish or grayish and on old trunks scaly-ridged. The leaves are in clusters of two, thickly set on the twigs, bluish or grayish green, often twisted, 2′-5′ long. The cones are mostly curved and dull gray in color; the scale has a thick, squarish, curved tip without spine.

6. Red Pine (*P. resinosa Ait.*). A tall straight tree, at first somewhat pyramidal but at maturity forming a round top. The twigs are yellowish becoming light reddish brown. The bark on old trunks cracks into shallow, irregular ridges covered by thin, loose, light red-brown scales. The leaves are thickly set at the end of the twigs, two in a cluster, slender, flexible,

shining dark green, 4′-6′ long. The cone is ovoid, shining light brown, growing at right angles to the branchlet, about 2′ long. The scale of the cone is thickened at the tip and without spine. This is a valuable timber tree of dry woods, ranging from eastern Canada to

Manitoba, and southward to northern Minnesota and Pennsylvania.

The extensively cultivated Austrian Pine (*P. Austriaca Hoess*) is a beautiful tree and similar to the Red Pine. The twigs are brownish or yellow-brown, thickly set with stiff and very dark green needles. The bark on old trunks cracks into coarse irregular flat plates covered with grayish brown, or nearly black, thin scales. The scales of the cone are tipped with a short spine.

7. **Scrub Pine** (*P. virginiana Mill.*). A short-stemmed tree with long, widely separated branches forming a somewhat flattened pyramidal top. It often has irregular branching which makes it more attractive. The twigs are purplish with whitish coating, becoming gray-brown. The bark on old trunks is cracked into

shallow flat ridges with thin dark-brown scaly surfaces. The leaves are two in a cluster, stout, flattish, deep green (sometimes with grayish tinge), and twisted, 1.5′-3′ long. The cone is narrow ovoid, dark red-brown, 2′-3′ long. The scales are tipped with slender, generally curved spines. It is a tree of sandy, gravelly soils, ranging from Long Island to southern Indiana southward.

8. **Table Mountain Pine** (*P. pungens Lamb.*). A slender tree with rounded top rarely over 40° high. The twigs are light orange in color, becoming dark brown. The bark on the old branches cracks into thin loose scales, and on old trunks breaks into large scaly plates of a red-brown color. The leaves are crowded

on the twigs, usually two in a cluster, and twisted, bluish green in color, 1′-3′ long. The cones are uneven at the base and often in clusters of three or more,

shining, light brown, 2′-4′ long; the scales of cone tipped with stout curved spine. It is found in the Appalachian Mountains from New Jersey southward.

AMERICAN LARCH. TAMARACK

(*Larix laricina Koch.*)

This is a slender, graceful tree, often spire-like, with small horizontal or drooping branches. The twigs are smooth, orange-brown, becoming darker with age. The bark is smooth, cracking into thin, roundish, reddish-brown scales. The leaves are borne in dense clusters at the end of very short twigs; soft, bright green,

about 1′ long. On vigorous branchlets the leaves are not clustered but borne singly. This tree and the Bald Cypress are the only American Cone-Bearing Trees that shed their leaves in the fall. In the spring the delicate green leaves together with the young reddish cones give the Larches a charm that is equalled by few trees. The cones are ovoid, less than 1′ long, with thin roundish scales. This tree is found mostly in swamps throughout Canada, southward to Maryland, northern Indiana, Illinois and Minnesota.

The familiar cultivated European Larch (*L. decidua Mill.*) is sometimes found in a wild state in the New England States. It has longer leaves and cones; the branches generally drooping, with yellowish twigs.

SPRUCE (*Picea Link.*)

The Spruces are the most common representatives of the Cone-Bearing Trees in Canada and the northern United States. The stems are tall, the tops spire-like, and the slender branches are arranged in whorls. The wood is resinous, valuable as lumber, and the principal source at present of wood pulp. The leaves are arranged in spirals around the branchlets, but often become twisted so that they are either crowded upon the upper side or separated into two rows, one on each side of the branchlet. The leaves are four-sided, stiff, with a very minute stem which becomes woody and remains standing out from the twigs after leaf-fall. The bark is thin and scaly. The cones are ovoid or cylindrical and hang down from the twigs. Within our range there are only three native spruces, though there are many cultivated forms.

Key to the Species of Spruces.

Twigs smooth, scales of cone flexible. 1. White Spruce.
Twigs hairy, scales of cone firm.
  Cones falling in early winter. 2. Red Spruce.
  Cones hanging on twigs for years. 3. Black Spruce.

1. **White Spruce** (*P. canadensis BSP.*). A handsome tree, frequently 50°-70° high. The twigs are stout, smooth, light yellow-brown, becoming grayish brown. The bark on young trees is nearly smooth but on old trunks it cracks into thin, light gray or brownish irregular scales. The leaves have an unpleasant odor when crushed; they are squarish, somewhat curved, sharp-tipped, and bent upward so that they lie

on the upper side of the branchlet; at first pale bluish and silvery, becoming blue-green, 0.3′-1′ long. The cones are cylindrical, greenish, becoming light brown and shining, soft and papery, 2′-3′ long, with very thin and flexible roundish scales. The cones frequently

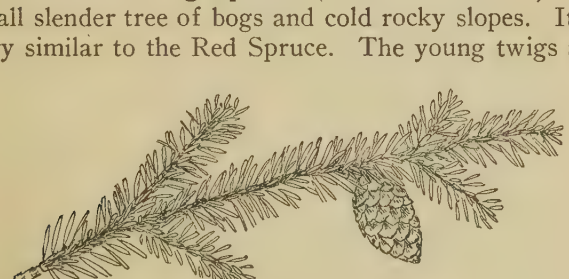
almost cover up the top of the tree. It is found throughout Canada, southward to southern Maine, and westward through the Lake States.

2. **Red Spruce** (*P. rubra Link.*). This is also a splendid and valuable tree, though somewhat smaller than the White Spruce. The twigs are hairy and yellowish green or reddish brown, becoming smooth and dark brown with age; on old branches often drooping. The bark on old trunks cracks into thin irregular red-brown or grayish scales. The leaves often spread from all sides of the twigs; they are squarish, curved, somewhat blunt-pointed; color greenish, with tinge of yellow, becoming deep green and very shining, 0.3′-1′ long. The cones are ovoid, reddish green, becoming light reddish brown, usually less than 2′ long, with firm roundish scales. Before the Wrigley habit became established among adults in America the

resinous juice of this tree furnished the spruce chewing gum for children. Its range is from eastern Canada along the St. Lawrence to New York and southward in the mountainous districts to North Carolina and Tennessee.

The familiar Norway Spruce (*P. Abies Karst.*) is an introduced shade tree, reported as established in Connecticut. It is recognized by its long drooping branchlets; the twigs are brownish and usually smooth. The bark is coarsely scaly and red- or gray-brown. The leaves are slender, dark green, shining. The cones are very large and cylindrical, 4′-6′ long.

3. Black or Bog Spruce (*P. mariana BSP.*). A small slender tree of bogs and cold rocky slopes. It is very similar to the Red Spruce. The young twigs are



rusty hairy and light yellow-brown in color, becoming brownish and smooth with age. The bark is scaly and gray-brown. The leaves are nearly straight, spreading from all sides of the twigs; pale or dark bluish green with whitish coating; rarely 0.5′ long. The cones are purplish brown, about 1′ long, and remain on the branches for years. The scales of the cone are often slightly toothed. It is found from central Pennsylvania northward, in the mountains, along the Great Lakes and throughout Canada.

CANADIAN HEMLOCK (*Tsuga canadensis Carr.*)

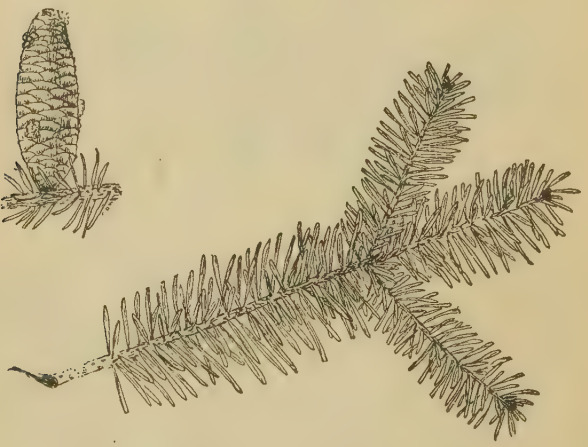
This is a large forest tree usually found on rocky ridges, steep sides of ravines, and mountain slopes. The branches are long and slender, with somewhat drooping branchlets. The twigs are delicate, light yellow-brown, becoming dark reddish brown. The bark

on old trunks cracks into deep, coarse, gray-brown ridges, covered with thick scales that have a red under surface. The leaves are short, flat, blunt, usually in two rows, shining dark yellow-green above with a silvery stripe beneath; 0.3′-0.5′ long with a minute petiole which stays on the twig after leaf-fall. The foliage of the Hemlock is perhaps the most delicate and graceful of any of our Cone-Bearing Trees, and is especially striking in the spring. The cones are ovoid, brownish, 0.5′-1′ long, with thin roundish scales. It is found in eastern Canada, through the States and Provinces bordering on the Great Lakes, and southward through the Appalachian Mountains.

The Carolina Hemlock (*T. caroliniana Engl.*) is a small tree, rarely 60°. It closely resembles the Canadian Hemlock but differs in its longer shining deep green leaves (0.6′-0.8′) and longer cones (1′-1.5′), the scales of the cone being oblong. Its range is from the mountains of Virginia, through the Blue Ridge to Georgia.

BALSAM FIR (*Abies balsamea Mill.*)

This tree is the most popular of our evergreens. The regular spreading branches, forming a spire-like top, and the fragrant silvery foliage make a familiar sight during the Christmas season. Unfortunately the



country can ill afford at present to sacrifice annually the millions of trees that are used in this way. When an adequate forestry policy is established it will be possible to meet this need without harm. In the meantime it would be a good plan to adopt the excellent suggestion recently advanced to plant each year a

Christmas tree for the birds, about the house, school or parks. Here is an opportunity to do something worth while and to experience a pleasure that few realize.

This tree attains a height of 40°-60°; the branches are arranged in whorls of four to six. The twigs are at first hairy, yellowish or brownish green, becoming smooth, grayish red or purplish. The bark is gray-brown, nearly smooth; generally with resinous blisters, and on old trunks sometimes cracking into scaly plates. The leaves are usually in two rows, flat, generally blunt-pointed, shining dark green above, silvery beneath, 0.5′-1′ long. There is no petiole; therefore the twigs are smooth after leaf-fall. The cones are erect, cylindrical, sticky with resin, purplish, 2′-4′ long. The scales of the cone are oblong and fall off while the cone is attached to the tree. It is found throughout Canada, northern New England, and the Appalachian Mountains to Virginia, and westward through the Lake States to northern Iowa.

The Fraser Fir (*A. fraseri Lind.*) is a small tree of the Alleghanies which occurs from southwestern Virginia to Tennessee. The bark is smooth, cracking on old trunks into thin brownish or grayish scales. The leaves are usually notched at the tips and are generally less than an inch long. The cones are usually over two inches long, with their scales partly covered by a downward-turning leaflet.

COMMON BALDCYPRESS (*Taxodium distichum Rich.*)

A lofty tree, frequently 100° high, with spreading branches forming a flat roundish top. It grows in swamps, frequently in standing water, with the base of the trunk greatly enlarged. Oddly shaped corky outgrowths, called "knees," develop from the roots

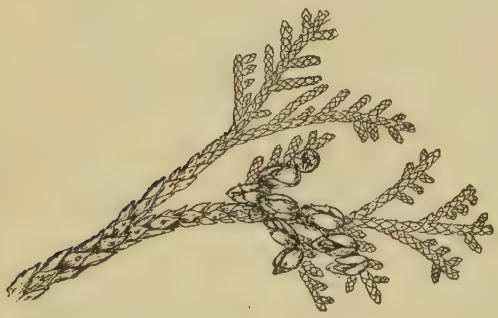
and reach up into the air, sometimes to a height of several feet. The twigs are delicate, and usually spread out in two rows on the branchlets, giving a feathery appearance. They are light yellow-green, becoming reddish brown with age. The bark cracks into broad flat, red-brown ridges, covered with thin fibrous scales.

The leaves are usually in two rows, narrow-oblong and flat, but on some branchlets they are sharp-pointed overlapping scales. They are light green, 0.5′-0.8′ long, and in the fall are cast off together with some of the twigs. The cones are roundish, rough, of a brownish color, about 1′ broad. It is found from southern New Jersey, and from southern Indiana and Illinois southward. It is one of our very valuable timber trees and often planted north of its range.

AMERICAN ARBORVITAE (*Thuja occidentalis L.*)

The spire-like top and compact bright green foliage have made this tree a favorite, and it is now cultivated in many forms. The branchlets are divided at their

ends into fan-like clusters of flattish twigs which are yellowish green, becoming after leaf-fall smooth, shining, and reddish brown. The bark is light brown, cracking into narrow, flat ridges that are somewhat fibrous and often spirally twisted. The leaves are small overlapping scales arranged in four rows, 0.1′-0.3′ long. Both wood and leaves are aromatic. The cones are



small, pale brown, 0.5′ long or less, with thin oblong scales. It is found on rocky banks of streams and in swampy ground, throughout Canada and the bordering States, and along through the mountains to Tennessee.

WHITECEDAR (*Chamæcyparis thyoides BSP.*)

This is a tall tree with spire-like top. The branches are slender, nearly horizontal, and divided into fan-like clusters of slightly flattened twigs, greenish in color, becoming reddish brown. The bark on young trees cracks into papery scales and on old trunks divides into narrow, flat, fibrous ridges, often with a spiral twist. The leaves are very small, scale-like, or awl-shaped, in 4 rows, dull blue-green (reddish in winter), strongly scented when crushed; about 0.1′ long. The cones are minute, smooth, round, purplish

to dark red-brown, 0.2′-0.4′ broad. The scales of the cone are flat-topped and provided with a minute point in the center. The Whitecedar grows in swamps from

southern Maine and New Hampshire, southward along the coast. Forms of this tree, the so-called Retinosporas, are perhaps the most extensively cultivated evergreens.

COMMON JUNIPER (*Juniperus communis L.*)

A small shrubby tree, rarely exceeding 20° in height, with erect branches forming an irregular, open top. Other forms are recognized, as *var. depressa*

Pursh, a shrub with branches spreading out from the center and forming mats 10°-20° broad and only two or three feet high. Another form (*var. montana Ait.*)

has stems creeping over the ground. The branchlets of the common Juniper are smooth, yellowish, becoming red-brown. The bark is thin, dark reddish brown, and cracks into thin scales. The leaves grow three in a whorl and stand out nearly at right angles to the twig. They are thin, needle-pointed, dark green above and grayish white-striped beneath; 0.3′-0.8′ long. The cones, found at the base of the leaves, are berry-like (the scales having become fleshy and grown together); they are at first green, becoming blue with a whitish coating; about 0.3′ broad. It is found in poor dry soils nearly throughout our range to southern Pennsylvania and Missouri.

REDCEDAR (*J. virginiana L.*)

This shrub or small tree is among the most widely distributed of our trees, and it is cultivated in several forms. It develops a spire-like or rounded top and in exposed situations often forms mat-like growths. The

wood is fine-grained and fragrant, and is used for lead pencils, cedar chests, etc. The twigs are squarish, slender, green, becoming dark red-brown and rounded after leaf-fall. The bark is light reddish or grayish brown and cracks into long narrow strips on old trunks. The leaves are aromatic, and of two kinds: scale-like and pressed close against the twigs, or needle-like and

spreading out from the twigs. They are usually developed in four rows on the twigs; are dark blue-green (often reddish in winter), and less than 0.1′ long. The cones are berry-like, bluish with white coating, and borne on short, erect stems. It is common on dry hills or low ground throughout our range, northward to southern Nova Scotia, Ontario and North Dakota.

THE BROAD-LEAVED TREES

POPLAR. ASPEN. COTTONWOOD
(*Populus L.*)

This is a group of large trees, having broad usually coarse-toothed leaves with long petioles that are often flattened. This peculiarity of the petiole causes the leaves to flutter and rustle in the faintest air current; and it is said that the name Populus was given to these trees because the music of their fluttering leaves resembles the murmurings of an assemblage of people. The twigs are stout, with large resinous buds at their tips. The bark is light colored, and on old trunks ridged. The soft wood of these rapidly growing trees will be extensively used in the future for wood pulp. The flowers are of two kinds and borne on different trees. They appear in the spring in drooping clusters before the leaves are developed. The pollen-producing flowers are reddish or purple, growing in thick fringe-like clusters (see No. 1, below). The seed-bearing flowers are in larger and narrower tassels. The minute seeds are formed in large numbers, in flask-shaped pods, each seed being surrounded by fine hairs (see No. 2 below). When the pods split open, the seeds escape in cottony masses, thus accounting for the name Cottonwood, applied to certain poplars. The hairy seed are carried by the wind in enormous numbers to great distances, which explains the sudden appearance of poplars in freshly cleared or burned lands. There are eight kinds of poplars within our range.

Key to the Species of Poplars.

Petiole strongly flattened.
Leaf roundish or ovate.

Leaf-margin smooth or fine blunt-toothed.
1. Quaking Aspen.
Leaf-margin coarse blunt-toothed. 2. Large-toothed Aspen.
Leaf triangular or kidney-shaped.
Branches spreading. 3. Southern Cottonwood.
Branches erect. 4. Lombardy Poplar.
Petiole rounded or slightly flattened.
Leaf white felty beneath. 5. White Poplar.
Leaf smooth or slightly hairy beneath.
Leaf blunt-pointed. 6. Swamp Cottonwood.
Leaf narrow-pointed.
Leaf pale or brown beneath. 7. Balsam Poplar.
Leaf green beneath. 8. Balm of Gilead Poplar.

1. **Quaking Aspen** (*P. tremuloides Michx.*). An attractive round-topped tree, 20°-50° high, usually with crooked branches drooping at the ends. The twigs are greenish, becoming shining red-brown, and

finally dark gray. The bark on young stems is thin, smooth, yellowish green or brown, sometimes greenish white, often roughened by horizontal bands. At the base of old trunks the bark is sometimes ridged and nearly black. The leaves are ovate or round heart-shaped, short-pointed, margins with fine teeth, smooth

(downy when young), 1.5′-4′ long; petioles strongly flattened near the leaf. See if you can ever catch this tree with motionless leaves. It is found on sandy and gravelly soils throughout Canada southward to Pennsylvania and Missouri.

2. **Large-toothed Aspen** (*P. grandidentata Michx.*). A large tree 40°-70° high with slender rigid branches forming a narrow rounded top. The twigs are at first very hairy, becoming smooth, shining, dark red-brown

or dark orange-colored, and finally gray with tinge of orange. The bark on young stems is smooth, light gray-green becoming at the base of old trunks dark brown, broken into broad flat ridges. The leaves are round-ovate with few coarse blunt teeth, smooth, white woolly when young and on vigorous young sprouts remaining so, 2′-5′ long. It is found in rich woods and on borders of streams and swamps, from eastern Canada to the mountains of North Carolina and westward to Iowa and Ontario.

3. **Southern Cottonwood** (*P. deltoides Marsh.*). A large tree 50°-125° high with massive branches spreading evenly upwards, forming a graceful, open top. The twigs are smooth, yellow-green, shining, be-

coming gray-green. The bark is smooth, light yellow, tinged with green, becoming green-brown, and on old trunks broken into deep, broad ridges of a gray or brown color. The leaves are triangular or broadly ovate, abruptly narrow-pointed, teeth numerous and rounded, shining, smooth, slightly hairy when young, 4′-6′ long. It grows along the borders of waterways from Quebec westward and southward; is less abundant east of the Alleghanies.

4. **Lombardy Poplar** (*P. nigra L.*). A spire-like tree covered from top to bottom with short, ascending branches, height 30°-70°. The twigs are olive-green becoming gray. The bark is gray or brown and ridged on old trunks. The leaves are triangular, ovate, usually broader than long, 1.5′-4′. This Poplar was formerly much planted and is a frequent escape.

5. **White Poplar. Abele. Silver Poplar** (*P. alba L.*) A wide-branching round-topped tree 40°-60° high. The twigs are densely white hairy (felty), becoming smooth and gray. The bark is smooth, green-

ish gray, often dark blotched, breaking on old trunks into coarse, firm, almost black ridges. The leaves are round-ovate, with irregularly lobed or wavy margins; smooth, dark green above, usually silvery and woolly

beneath, 1′-4′ long. Some of the forms have leaves with 3 to 5 lobes. This is an introduced tree, much cultivated and occasionally escaping.

6. **Swamp Cottonwood** (*P. heterophylla L.*). A tree of 40°-90° with short large branches forming a somewhat narrow top. The twigs are mostly coarse, hairy and pale brown or gray. The bark on young

stems is smooth, dark gray-brown, becoming on older trunks broken into coarse ridges of loose plates. The leaves are broadly ovate, tip blunt, base flat or slightly heart-shaped, round-toothed, smooth though sometimes hairy on veins beneath (velvety hairy when young). It is found in borders of swamps from Connecticut southward; also from Ohio and southern Illinois through the Mississippi Valley.

7. **Balsam Poplar** (*P. balsamifera L.*). A straight-stemmed tree, 30°-90° high, with a few spreading branches forming a narrowed top. The coarse twigs are yellow-brown, smooth, shining, becoming red-brown or gray with very sticky, fragrant buds. The bark on young trees is smooth, light red-brown, becoming later dark gray and broken into coarse ridges. The leaves are ovate to lanceolate, somewhat long taper-pointed, finely blunt-toothed, smooth, dark green, above, pale or brownish beneath, 3′-5′ long. It grows along the borders of swamps and rivers throughout Canada, southward to New England and westward to northern Iowa. It is cultivated in several forms.

8. **Balm of Gilead Poplar** (*P. candicans Ait.*). A form resembling the Balsam Poplar but having more wide-spreading branches which form a broad rounded top. The twigs are slightly hairy, red or yellow-green, becoming gray-green and smooth. The bark on young

trees is smooth, yellow-brown or gray; on old trunks becoming dark gray and irregularly rough ridged. The leaves are broadly ovate and often heart-shaped at base,

short-pointed, with blunt, regular teeth, hairy beneath, 2′-6′ long. It is a common tree in cultivation and escapes in many places, in Canada southward to Virginia and Michigan and to South Dakota. Its origin is not known.

WILLOW (*Salix L.*)

This is a large group. Most of them are shrubby, though a few attain the height of large trees. They demand only light and moisture. To start a tree you need only to stick a branch into moist ground. No other care is necessary and they grow very rapidly. No swamp or low river bank would be complete without the decoration of willows. The tree forms of these plants have for the most part irregular, crooked trunks, with the bark broken into dark gray or brown ridges. Their slender twigs bear small buds, usually flattened against the twig, and narrow, fine-toothed leaves with short petiole. There are two small leaflets (stipules) at the base of the petiole. These may fall off early or remain through the season. The flowers are of two kinds and borne on different plants. They are very small and densely grouped in erect or slightly drooping clusters. When they first appear in the early winter they are in small, silvery, hairy clusters—the so-called pussy willow stage. Early in the spring they grow longer, and the pollen-bearing ones take on a yellow or purple color (see No. 3, below). The seed-bearing clusters usually become greenish and produce many small, hairy seeds in each of the flask-like pods of the cluster. When the pods open the seeds are set free in cottony masses (see No. 1, below). There are 13 tree-like willows in our range, besides many cultivated forms.

Key to the Tree Forms of Willows.

Length of leaf more than 5 times the breadth.
Leaf margin smooth. 1. Common Osier.

Leaf margin with few narrow-tipped teeth.
2. Longleaf Willow.
Leaf margin with many fine teeth.
Leaf silky hairy, pale above and beneath (see exception).
3. White Willow.
Leaf smooth, dull green above, pale beneath.
4. Babylon Weeping Willow.
Leaf green above and beneath. 5. Black Willow.

Length of leaf less than 5 times the breadth.
Leaf broadest below the middle.
Teeth irregular or few or lacking.
Leaf green beneath, twigs very brittle at base.
6. Brittle Willow.
Leaf pale and usually hairy beneath. 7. Beak Willow.
Leaf whitish and smooth beneath. 8. Pussy Willow.
Teeth regular and fine.
Teeth gland-tipped.
Twigs smooth, crushed leaves spicy.
9. Balsam Willow.
Twigs hairy. 10. Missouri Willow.
Teeth not gland-tipped.
Leaf very shining, dark green, leathery.
11. Shining Willow.
Leaf dark green, thin and firm. 12. Peachleaf Willow.
Leaf pale green with silky hairs (see exc.).
3. White Willow.
Leaf broadest above the middle.
Leaf usually less than 3′ long.
Leaf very smooth. 13. Purple Osier.
Leaf hairy, especially on veins beneath. 7. Beak Willow.
Leaf usually more than 3′ long.
Tip of leaf short, teeth coarse or lacking.
8. Pussy Willow.
Tip of leaf long, narrow, teeth fine.
10. Missouri Willow.

1. **Common Osier** (*S. viminalis L.*). A shrubby tree, rarely over 15° high, the branches long, wand-like, yellow-green. The bark is nearly smooth and pale brown. The leaves are narrow lanceolate, smooth and dull-green above, silvery silky beneath, 3′-6′ long. It was introduced for wicker work, and is an occasional escape from Newfoundland to Pennsylvania.

2. **Longleaf or Sandbar Willow** (*S. interior Rowl.*). A shrub or rarely a slender tree, spreading readily by branches from the roots and often forming

thickets. The branches are erect, with slender, smooth, yellowish or purple-red branchlets. The bark is nearly smooth, dark brown tinged with red. The leaves are narrow lanceolate, rather short-pointed, narrowed at

each end, teeth widely separated, and often sharp-tipped; smooth and green on both sides but silky when young, 2′-5′ long. The petiole is very short. This willow is found on sandbars and low wet banks from eastern Quebec throughout our range, though it is rare in the Atlantic States.

3. **White Willow** (*S. alba L.*). A large tree 60°-90° high with large wide-spreading branches. The twigs are green and smooth. The bark is dull brown and coarsely ridged on old trunks. The leaves are

lanceolate, with long narrow tips, fine-toothed, silky hairy on both sides, 2′-5′ long. It is an introduced tree, much cultivated but rarely escaping.

The Golden Willow (*var. vitellina Koch*) is a very common form of the White Willow. It is cultivated nearly throughout our range and escapes readily, so that it is the most familiar of our willows. The twigs are brilliant yellow in the spring, becoming red-brown with age. The bark is dark gray or brown, and cracked on old trunks into coarse, scaly ridges. The leaves are silky hairy when young, but later become smooth and green above and whitish (sometimes slightly hairy) be-

neath. Another form of the White Willow is the cultivated Cricketbat Willow (*var. cærulea Koch*) with leaves bluish green above and nearly white beneath. It rarely escapes.

4. **Babylon Weeping Willow** (*S. babylonica L.*). A tree rarely over 60° high with long, gracefully drooping branches. The twigs are delicate, smooth, yellow-green, becoming brown and shining. The bark

on young stems is smooth and gray, but on old trunks breaks into a network of shallow ridges. The leaves are narrow lanceolate with very long, narrow tips; fine-toothed, smooth but hairy when young, bright green above and pale beneath, 2′-6′ long. It is extensively cultivated and escapes locally from Connecticut to Virginia and Michigan.

5. **Black Willow** (*S. nigra Marsh.*). A shrub or a tree with clustered stems 20°-60° high. The branching is irregular, forming an uneven open top. The twigs are reddish or grayish brown, becoming darker with age. The bark is dark brown or nearly black and divided into broad flat ridges that become shaggy on old trunks. The leaves are narrow-lanceolate with very long and often curved tips, bright green and smooth

above, slightly hairy on veins beneath, 2′-6′ long. This is one of the most common of our native willows. No low river bank or lake shore would seem complete

without these picturesque trees with their crooked black trunks and graceful foliage. It is found from southern Canada throughout our range. A form (*var. falcata Torr.*) with narrow curved leaves, is common from Massachusetts southward.

6. **Brittle Willow** (*S. fragilis L.*). A graceful tree often 50° high, with rounded top of upward-spreading branches. The twigs are yellow green often

with tinge of red, becoming shining brown with age. They separate from the branchlets with a cracking sound, by a slight pressure of the finger at the base of the twig. The winds often bring down a shower of

these twigs, and if they are carried away by rains or a stream and landed in a moist place, they take root and develop into trees. Several of the willows are spread in this way. The bark is smooth and gray on young stems, becoming dull brown and broken into irregular, scaly ridges on old trunks. The leaves are lanceolate with narrow tips, fine-toothed, or irregularly wavy toothed, smooth and green on both sides though slightly paler beneath; 3′-6′ long. This tree was introduced into New England before the Revolutionary War for basket manufacture, and is now distributed from Newfoundland to Quebec and southward to Kentucky.

7. **Beak Willow** (*S. Bebbiana Sarg.*). A shrub or small bushy tree, sometimes 25° high. The twigs are hairy, becoming smooth, purplish or brown. The bark is thin, reddish-green or gray, and becomes di-

vided into plate-like scales. The leaves are elliptic-lanceolate to obovate, firm, wrinkled, the teeth being few, coarse, often blunt and irregular, rarely lacking. The leaves are usually hairy; dull green above and whitish blue-green beneath, 1′-4′ long. This is a willow

that frequently wades out of the marshes into drier ground. It is found from Canada southward to New Jersey and Pennsylvania; westward to Nebraska.

8. **Pussy Willow** (*S. discolor Muhl.*). A shrub or small tree, frequently 10°-20° high. The twigs are stout and hairy, becoming smooth and red-purple. The bark is smooth and light brown, cracking into thin,

oblong scales. The leaves are lanceolate to elliptical, teeth blunt and irregularly placed, bright green above, whitish and often silvery beneath, smooth on both sides though hairy when young, 2′-5′ long. It is found throughout our range south to Delaware and Illinois. A related form (*S. eriocephala Michx.*) has very hairy twigs. Leaves often permanently rusty hairy beneath and coarsely toothed.

9. **Shining Willow** (*S. lucida Muhl.*). A shrub or small tree, rarely 25° high with short trunk and many erect branches forming a round symmetrical top. The twigs are smooth, shining, orange brown, becoming

darker, often with tinge of red. The bark is smooth, brown or reddish brown, breaking on very old trunks into rough ridges. The leaves are ovate-lanceolate

with long narrow tips, fine-toothed, leathery, very shining dark green, smooth but hairy when young, 2′-6′ long. It is found throughout our range to Virginia, Kentucky, and Nebraska; sometimes cultivated. Forms with very narrow leaves or with leaves hairy beneath are found in the northeastern part of our range.

10. **Peachleaf Willow** (*S. amygdaloides Anders*). A small tree, though some attain a height of 40°-60°, with straight ascending branches forming a rather nar-

row round top. The twigs are slender, dark orange or red-brown and shining, becoming orange-brown. The bark is brown, often with reddish tinge and broken on old trunks into irregular, flat ridges. The leaves are ovate-lanceolate with long, very narrow tips often curved, fine-toothed, shining green above pale or silvery beneath, 2′-6′ long. It is found on borders of waterways, from western Quebec westward along the Great Lake Provinces; southward to New Jersey, Kentucky and Nebraska; not common in the east.

11. **Balsam Willow** (*S. balsamifera Barr.*). A shrub —occasionally a small tree—with slender, erect stems. The twigs are shining, light red-brown becoming yellow-green. The bark is thin, smooth, dull brown-gray.

The young leaves are aromatic, elliptical, short-pointed, fine or sometimes coarse-toothed, thin and firm, dark green above, pale or silvery beneath, smooth but hairy when young, 2′-4′ long. Found in bogs and lowland thickets, from Canada to northern New England and westward to Minnesota and South Dakota.

12. **Missouri Willow** (*S. missouriensis Bebb.*). A tree 30°-50° high with straight trunk and slender, upright or slightly spreading branches. The twigs are

velvety hairy and light green during their first year, becoming brownish or reddish brown and usually smooth. The bark is thin, smooth, light gray, becoming darker on old trunks and broken into plate-like

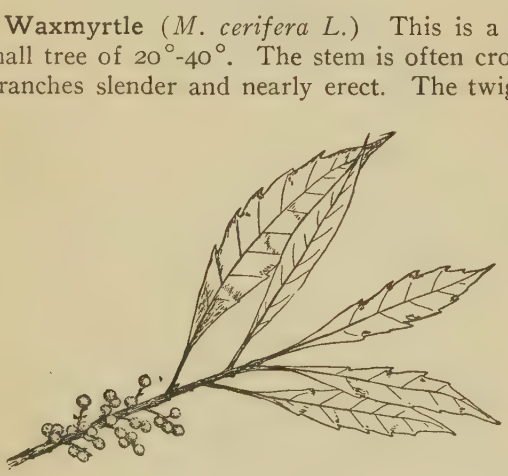
scales. The leaves are lanceolate to obovate, fine-toothed, smooth, dull green above, pale green or whitish beneath; sometimes slightly hairy (hairy on both sides when young); 3′-6′ long. Found in the sandy river bottoms of the tributaries of the Mississippi and Missouri rivers, from Kentucky to Illinois and Nebraska.

13. **Purple Osier** (*S. purpurea L.*). A shrub, or sometimes a slender tree 30°-50° high, with long slender branches. The twigs are long, wand-like and purple. The leaves are placed nearly opposite on the twigs; oblanceolate, slightly toothed, very smooth on both sides, dull green above, pale or whitish beneath, 1′-3′ long. Introduced for basket rods and ornament, and now escaped locally in the Middle and Eastern States.

BAYBERRY. WAXMYRTLE (*Myrica L.*)

These plants are shrubs or small trees with gray, smoothish bark and scaly buds. The leaves in some species are evergreen, toothed and resinous-glandular. The flowers are very minute and in compact clusters. They are of two kinds and usually borne on different trees. The pollen-bearing flowers are cone-like and become drooping clusters when the pollen is being shed. The seed-bearing clusters consist of a few flowers and form bunches of nutlets which are usually covered with a paraffine-like wax.

1. **Waxmyrtle** (*M. cerifera L.*) This is a shrub or small tree of 20°-40°. The stem is often crooked; the branches slender and nearly erect. The twigs are



rusty hairy, becoming bright red or gray-brown, smooth and shining, darker with age. The bark nearly smooth, light gray. The leaves evergreen, aromatic, oblanceolate, thick and firm, margins smooth or with a few coarse teeth towards the apex; dotted on both sides

with glands; 1′-3′ long. The small nutlets are closely clustered on short twigs and covered with a bluish-white wax. Flourishes in moist, sandy soil, from southern New Jersey southward along the coast.

2. **Bayberry** (*M. carolinensis Mill.*). A small plant, rarely exceeding 10° in height, often forming large colonies in poor dry soils. The twigs are at first slightly hairy, becoming smooth and brownish gray.

The leaves are aromatic; oblong, narrowed at the base, blunt-pointed, smooth, dark green, dotted above and beneath with yellow glands, teeth few and blunt or lacking; 2′-4′ long. The nutlets are in crowded clusters on the branchlets and covered with a grayish-white wax. The wax from these fruits and that of the preceding species was used by the early settlers for candles. This plant is of common occurrence from eastern Canada southward along the Atlantic States; also on the shores of Lake Erie. There are two other common shrubs in this group: The Sweet Gale (*M. Gale L.*) with erect, dark brown stems, leaves wedge-shaped and sharp-toothed at tip, dark green above, pale beneath, smooth, 1′-3′ long; nutlets in small cone-like clusters; found on borders of swamps from Canada and Great Lake states, in the mountains to Virginia; and the Sweet Fern (*M. asplenifolia L.*) a fragrant, attractive little

shrub, rarely exceeding 2° in height and forming extensive patches on dry uplands. The leaves are long and narrow with scalloped margins, 3′-5′ long. The fruit is small, burr-like. Found from Canada southward to North Carolina and Indiana.

WALNUT (*Juglans L.*)

This is a group of large trees valuable for timber and also for their nuts. The branches are coarse and wide spreading; the bark ridged; the large terminal buds have two pairs of opposite scales. The pith of the twigs is chambered (in thin plates separated by cavities). The leaves are large, aromatic and composed of numerous hairy, toothed leaflets. The flowers are very minute, of two kinds, and borne on the same tree. The pollen-bearing flowers appear in the spring in long drooping clusters. The seed-bearing clusters are few-flowered and develop into ridged nuts covered with a fleshy rind.

1. **Butternut** (*J. cinera L.*). A tree 40°-80° high with short trunk and heavy spreading branches form-

ing a broad and rather irregular top. The twigs are coarse, at first sticky and rusty-hairy, greenish, becoming smooth, yellow, or red-brown. The bark on young stems is smooth and grayish, becoming cracked into flat ridges of a brownish gray color. The leaf is 1°-2° long, composed of 7-14 oblong-lanceolate leaflets. They are yellow-green, rough above, hairy beneath, sticky when young, sharp-toothed, 2′-4′ long. The fruit is usually in clusters of 3-5 cylindrical nuts, greenish hairy, becoming brown, 2′-4′ long. The brown shell of the nut has sharply notched ridges. A yellow-brown dye used by the early settlers for dyeing their homespun was obtained from the rind of the nut and from the fresh bark. Found in rich woods and pastures from eastern Canada and Ontario southward throughout our range.

2. **Black Walnut** (*J. nigra L.*). This is a handsome tree frequently 100° high, with straight trunk, stout, spreading branches, and beautiful foliage. The

twigs are velvety brown, becoming nearly smooth and light brown. The bark on young stems is smooth, brownish, becoming scaly, and on old trunks, breaking into prominent ridges covered with thick, dark brown scales. The leaves are 1°-2° long and composed of

11-23 ovate-lanceolate leaflets; the leaflets smooth, bright green, shining above, hairy beneath, sharp-toothed, about 3′ long. The fruit usually solitary or in pairs, roundish, dull green becoming brown, 1′-2′ broad. The nut is dark brown with irregular, smooth ridges. One of our most valuable timber trees; found in rich soils from western Massachusetts to Ontario and Minnesota southward.

HICKORY (*Hicoria Raf.*)

These trees are found only in eastern North America with the exception of one species in Mexico and one in China. They are large trees with somewhat narrowed tops. The wood is very strong and elastic. The twigs have a solid pith (not chambered) and scaly buds. The leaves are composed of several leaflets, often aromatic, toothed, thick and firm. The flowers are of two kinds, very small, borne on the same tree. The pollen-bearing flowers appear in the spring in long drooping clusters. The seed-bearing flowers are in small clusters. They develop into solitary or few-clustered, roundish fruits with a firm husk (rind) that splits open at maturity exposing a smoothish nut. There are eight hickories within our range and the majority of them are valuable trees.

Key to the Species of Hickories.

Bud scales opposite (see No. 2 below).
  Leaflets 9 to 17. 1. Pecan.
  Leaflets 5 to 9. 2. Bitternut.
Bud scales overlapping (see No. 5 below).
  Bark firm, rough or ridged.
    Leaves smooth or nearly so.
      Fruit roundish; husk splitting to base.
        3. Small Fruited Hickory.
      Fruit pear-shaped; husk not splitting to base. 4. Pignut.
    Leaves hairy.
      Nut brownish, narrowed at end. 5. Mockernut.
      Nut white; rounded at end. 6. Pale Hickory.
  Bark in long loose plates; husk of nut thick, splitting to base.
    Leaflets 3 to 5. 7. Shagbark Hickory.
    Leaflets 7 to 9. 8. Shellbark Hickory.
  Bark scaly, husk thin, splitting to base of nut.
    3. Small-fruited Hickory.

1. **Pecan** (*H. pecan Britt.*). A splendid tree, occasionally 180° high, with stout branches that, given room, spread out into a broad, rounded top. The twigs are hairy, becoming smooth and red-brown. The bark

is reddish brown, breaking on old trunks into a network of thick scaled ridges. The leaves are 1°-1.5° long and composed of 9 to 17 lanceolate leaflets, often curved, coarsely toothed, dark green above, pale beneath, 4′-8′ long. The fruit is oblong with thin husk splitting nearly to the base, 1′-2′ long. The nut is brown, smooth, pointed at each end; seed sweet. Grows in river bottoms from eastern Indiana and Iowa southward. Now cultivated for its nuts and in several varieties.

2. **Bitternut** (*H. cordiformis Britt.*). A slender tree sometimes 100° high with spreading branches and attractive foliage. The slender twigs are greenish and hairy, becoming reddish or yellowish brown and smooth, finally gray. The buds at the ends of the twigs are very characteristic, flattened and bright yellow. The bark is gray and smooth on young stems, becoming cracked into a network of shallow, firm, flat ridges. The leaves are 6′-12′ long and composed of 5 to 11

(generally 9) leaflets which are lanceolate, coarse-toothed, yellow-green and smooth above, pale and hairy beneath. The fruit is roundish, covered with yellowish scales, having four ridges or wings at top. The husk

is thin and splits part way to the base. The nut is gray or red-brown with thin shell and very bitter seed. Found in swampy ground and also in uplands; distributed from southern Maine, Quebec, and Ontario to Minnesota and southward.

3. **Small Fruited Hickory** (*H. microcarpa Britt.*). A tree occasionally 100° high with slender branches forming a somewhat narrow top. The twigs are greenish, hairy, becoming smooth, red-brown and shining;

buds greenish becoming red-brown and smooth. The bark is grayish and smooth on young stems, later becoming cracked into ridges and finally broken into narrow, plate-like scales, thus giving a shaggy appearance. The leaves are 8′-12′ long and composed of 5-7 oblong or ovate leaflets, long, narrow-pointed, teeth sharp and short, light green, shining and smooth above, 2′-6′ long. The fruit is roundish, slightly hairy or minutely scaly; husk thin, splitting to the base, about 1′ long. The nut is light colored, somewhat flattened, thin-shelled, seed sweet. An exceedingly variable species, found in rich uplands, from southeast Ontario and Massachusetts to Michigan and Iowa southward.

4. **Pignut** (*H. glabra Britt.*). This tree resembles the Small Fruited Hickory. The branches are rather slender and drooping, forming a more open top. The twigs are nearly smooth, greenish, becoming tinged

with red and finally gray-brown. The buds are greenish or grayish and smooth. The bark is smooth, light gray on young stems, becoming dark on old trunks and cracked into rough, flattish ridges that are sometimes scaly. The leaves are 6′-12′ long, composed usually of 5 or 7 lanceolate or oblanceolate leaflets, sharp-toothed,

yellow-green and smooth above, 2′-6′ long. The fruit is usually pear-shaped, smooth, with thin husk that generally splits part way to base, sometimes remaining closed, or again separating almost to the base; 1′-2′ long. The nut is light brown with thick or thin shell; the seed sometimes sweet or again bitter. The Pignut flourishes in dry uplands from New Hampshire to southern Ontario, Illinois and Kansas, southward to Virginia and along the Appalachian Mountains to North Carolina. The Pignut and Small Fruited Hickory will be found growing together and will be recognized by the fruit and bark characters mentioned above. However, there are also puzzling forms that show characters intermediate between these two species.

5. **Mockernut** (*H. alba Britt.*). This handsome tree has a height of 50°-90°. The branches are comparatively short, forming an oblong top. The abundant fragrant foliage is attractive alike in summer and fall.

The twigs are stout, hairy, brownish, becoming nearly smooth, often tinged with red, and finally gray. The bark is gray; breaks into a network of shallow, firm ridges, on old trunks the ridges becoming deep and rough. The large, fragrant leaves are 8′-15′ long and composed of 5 to 9 obovate to oblong-lanceolate leaf-

lets, fine or coarse-toothed, shining dark yellow-green above, paler and hairy beneath, 3′-8′ long. The fruit is roundish, 1′-2′ long, with very thick husk, splitting nearly to the base; the nut, light red-brown, four-angled, pointed at top, rounded at base, very thick shell, seed sweet; a fine looking nut but a joke when you crack it and discover the size of the seed. The Mockernut generally grows on rich, dry ridges; is found from eastern Massachusetts to southern Ontario, Michigan to Nebraska southward.

6. **Pale Hickory** (*H. pallida Ash.*). This tree rarely exceeds 50° in height. The twigs are slender, reddish brown and sometimes hairy, with buds that become brownish and scurfy-hairy in the fall. The

bark is grayish brown, smooth, becoming slightly ridged or sometimes broken into very rough, deep ridges, almost black. The leaves are 6′-15′ long and composed usually of 7 lanceolate leaflets, fragrant, fine-toothed, dark green above, pale and often yellowish beneath, silvery-scaly when young. The fruit is roundish, usually hairy, husk usually splitting nearly to base, 1′-2′ broad. The nut white, thick-shelled, seed sweet.

It is found usually in sandy soils from southern New Jersey and Pennsylvania southward.

7. **Shagbark Hickory** (*H. ovata Britt.*). This is the best known hickory in the North because of its fine nuts. It is a handsome tree, often 80°-90° high, with lustrous, clean foliage. The twigs are stout, at first

brown hairy, becoming smooth, shining, red-brown, finally gray. The bark is smooth, brownish gray on young stems, cracking into shallow, firm ridges, and on old trunks breaking into thick plates sometimes a foot or more long. These plates are often attached to the trunk at the middle, and the ends turn outward, giving the trunk a shaggy appearance. The leaves are 8′-14′ long, composed usually of 5 obovate or oblong-lanceolate leaflets, fine-toothed, dark yellow-green and smooth above, shining and smooth or slightly hairy beneath, 4′-7′ long. The fruit is roundish with thick husk, separating completely into four parts, 1′-2′ long. The nut is whitish, usually thin-shelled, somewhat wrinkled, and ridged, seed sweet. It prefers low hillsides and river bottoms, and is found from southern Quebec and Ontario nearly throughout our range.

8. **Shellbark Hickory. King Nut** (*H. lacinosa Sarg.*). This fine tree is suggestive of the Shagbark Hickory in many respects; the twigs are, however, yellowish and hairy at first and finally grayish. The old bark is sometimes broken into enormous plates (3°-4° long) that do not curve out as much as in the Shagbark. The leaves are 1°-2° long and composed usually of 7 leaflets, shining dark green above, paler and soft-hairy beneath. The fruit is larger, 2′-3′, and the nut is dull yellowish white, or brownish, thick-shelled, pointed at each end. It prefers moister soils than the Shagbark, and is found from central New York southward along the Appalachian Mountains to Tennessee and from southeast Ontario through Michigan, Indiana, Illinois to southern Iowa, Nebraska and Kansas southward.

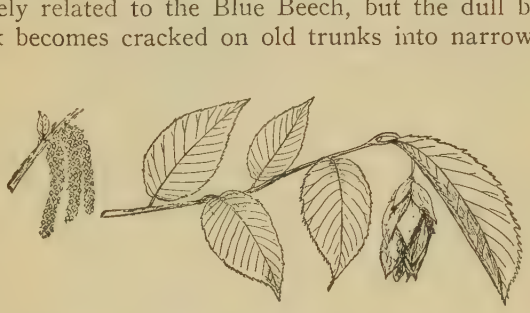
HORNBEAM, BLUE BEECH (*Carpinus caroliniana Walt.*)

This is a small bushy tree nearly 40° high with stout, spreading, crooked branches forming a flat top. The twigs are very slender, pale green and hairy, becoming smooth, shining dark red and finally dull red-

dish gray. The short trunk is uneven as though having muscles under its smooth, slate-gray bark. The leaves are long ovate, the base rounded, often unequally, sharply double-toothed (the teeth spreading out from the margin) dull green above, light yellow-green and hairy on veins beneath, 2′-4′ long. The flowers are minute, in cone-like clusters and of two kinds on the same tree. The pollen-bearing cones become long drooping clusters in the spring when shedding their pollen. The seed-bearing cones develop into long clusters of three-lobed leaflets having a small nutlet at the base of each leaflet. These leaflets are green in the summer, becoming brown in the fall. They are blown away in early winter. The Hornbeam is found along streams from Nova Scotia to western Ontario southward.

AMERICAN HOPHORNBEAM. IRONWOOD (*Ostrya virginiana Koch.*)

An elegant tree, sometimes 60° high, with slender branches forming a very symmetrical ovoid top. It is closely related to the Blue Beech, but the dull brown bark becomes cracked on old trunks into narrow, ob-



long, plate-like scales. The ovate or oblong-ovate leaves have sharp double teeth that curve in towards the tip of the leaf. The flowers are also similar, but the nutlets are inclosed in a papery flattened sac and arranged in hop-like clusters. It prefers drier soils than the Blue Beech and is found from Nova Scotia to Manitoba and North Dakota southward.

AMERICAN HAZELNUT (*Corylus americana Walt.*)

A shrub or small bushy tree usually forming thickets. You should know these thickets because they will furnish nearly every year a crop of hazelnuts, though the squirrels may reach them first. The twigs and buds are stiff-hairy, russet brown, becoming dark brown and smooth. The leaves are thin, roundish-heart-shaped, coarsely double toothed, roughish above and hairy beneath, 3′-5′ long. The flowers resemble those of the Blue Beach, but the seed-bearing flowers are in very

small cones and form large nuts surrounded by stiff curled leaves. Found from Maine to Saskatchewan and southward.

The Beaked Hazelnut (*C. rostrata Ait.*) is a more northern form, having almost smooth twigs and ovate oblong leaves that are somewhat lobed. The leaves about the nut are united and prolonged into a densely bristly tube.

BIRCH (*Betula L.*)

The Birches are the most elegant forest trees of North America. The delicacy of the branches and the symmetry of their arrangement give them a distinct charm. Combined with these features are variations in the character and coloration of bark that delight us equally in summer and winter. The slender branches of some kinds have short side twigs each bearing two leaves. The bark is smooth, resinous (therefore burning readily), marked with horizontal lines, sometimes cracking into papery sheets, or on old trees of some species, breaking into thick plates or coarse ridges. The leaves are ovate or triangular, often uneven at the base, sharp-toothed, rarely lobed. The flowers are of two kinds. The pollen-producing flowers grow in slender, erect, cone-like clusters of overlapping scales, the clusters becoming long drooping tassels when the pollen is shed in the spring (Nos. 1, 4). The seed-producing flowers are in shorter, thicker cones. The fruit is a minute, winged nutlet containing a single seed, each one covered by a scale of the cone. Fruit and scales are shed in the winter. (Nos. 2, 4.) There are many cultivated varieties of Birches in addition to the native (wild) forms mentioned below.

Key to the Species of Birches.

Branchlets with wintergreen taste.
  Bark dark brown, not cracking into papery layers.
    1. Sweet Birch.
  Bark yellowish or silvery, cracking into papery layers.
    2. Yellow Birch.
Branchlets without wintergreen taste.
  Bark light reddish brown, cracking into papery layers.
    3. River Birch.
  Bark creamy white, cracking into papery layers.
    4. Canoe Birch.
  Bark dull-white, not separating easily into layers.
    5. Gray Birch.

1. **Sweet or Cherry Birch** (*B. lenta L.*). A forest tree occasionally 80° high. Bark smooth, shining, resembling that of the cultivated cherry, dark brown

tinged with red, marked by horizontal lines; on old trees broken into thick, irregular grayish plates. Branches slender, the lower ones nearly horizontal and often drooping at the ends. Twig with sweet wintergreen taste. Leaf ovate, base often uneven, heart-shaped or rounded, sharp double teeth, dark green above, paler and slightly hairy in angle of veins beneath, silky-hairy when young, 2′-6′ long.

2. **Yellow Birch** (*B. lutea Michx.*). Differs from the Sweet Birch in its very shining yellow or silver-gray bark, which cracks into loose, ribbon-like strips,

curling at the ends. On old trees the bark often cracks into thick, rough, brownish or grayish plates. Branches

coarser and twigs with slight wintergreen taste. Leaf less heart-shaped, more hairy on veins beneath, 2′-4′ long. From Canada to Massachusetts, Tennessee, and Illinois.

3. **River Birch** (*B. nigra L.*). A beautiful tree of river banks and swamps. Bark shining, reddish or grayish brown, cracking into thin papery scales that cover the trunk and large branches with a shaggy

coat; bark of old trees cracked into dark brown thick plates. Twigs reddish. Leaves narrow at base, irregularly sharp-toothed, sometimes lobed, deep green, shining, very hairy when young, 1′-3′ long. New Hampshire to Minnesota southward.

4. **Canoe or Paper Birch** (*B. papyrifera Marsh*). This attractive forest tree is recognized by its creamy white bark (rarely bronze-colored), which peels off

readily into papery layers; inner bark in shades of orange. There are several varieties; the common one has ovate leaves narrowed or rounded at the base, irregularly toothed, dull green, usually smooth above, slightly hairy in angles of veins beneath, hairy and resinous when young, 1′-4′ long. Canada, southward to Pennsylvania, Indiana, Iowa, and Nebraska.

A small tree or shrub (var. *cordifolia Fern.*) with broadly ovate, heart-shaped leaves, is found from Canada to New England and the Great Lakes.

5. **Gray or Poplar Birch** (*B. populifolia Marsh*). A small tree, rarely 35° high, found on poor soil and swamp margins. Bark dull, chalky-white, not peeling readily; marked with black triangular spots

below each branch. Bark of young trees and of branches bright reddish brown. Leaf triangular, with long, narrow tip, base flat or slightly heart-shaped, coarse-toothed, dark green, smooth and shining; resinous when young, 2′-3′ long. From eastern Canada to New York, southward to West Virginia and Delaware.

The Blue Birch (*B. cærulia Blanch.*) differs from the Gray Birch in its more ovate, dull, bluish-green leaves, narrowed at base; also in its shining, creamy or pinkish-white bark.

ALDER (*Alnus L.*)

The Alders are shrubs, or small trees, commonly with crooked stems and branches forming tangled thickets in wet ground and along streams. The bark is smooth and brownish. The leaves ovate-elliptical or obovate and sharp-toothed. The flowers very minute, in cone-like clusters; of two kinds and borne on the same tree. The pollen-bearing cones become long drooping tassels in the early spring when the pollen is being shed. The seed-producing flowers are in small green cones that grow larger during the summer. In the fall they have become woody and crack into hard scales, thus liberating the minute winged nutlets. Three of our alders are distinguished as follows:

The Hazel Alder (*A. rugosa Spreng.*) is recognized by its smooth, brown bark, and obovate leaves narrowed at the base, with sharp, nearly regular teeth;

dark green above and slightly hairy beneath. It is found from Maine southward (mostly along the coast, rarely inland) to Minnesota.

The Speckled Alder (*A. incana Moench.*) has a smooth gray-brown bark, with small, whitish, horizontal spots. The leaf is elliptical to ovate, rounded at the

base, double toothed and downy beneath. This is the common alder throughout Canada and southward to Pennsylvania, Iowa, and Nebraska.

The European Alder (*A. rotundifolia Mill.*) is a cultivated tree often 60° high. The leaves are roundish and sticky, at least when young. It has escaped from eastern Canada to New Jersey and Pennsylvania.

AMERICAN BEECH (*Fagus grandifolia Ehrh.*)

A tree of unusual charm both in summer and winter. In the forest the trunk is tall and slim with slender branches forming a narrow top, but in the open the trunk is short with wide spreading branches. The twigs are slender, light green, hairy, becoming smooth, yellow, and finally changing to reddish brown and gray. The bark is smooth, light steel-gray, often blotched with lighter or darker patches. The leaves are in two rows on the long twigs at the end of the branchlets, but

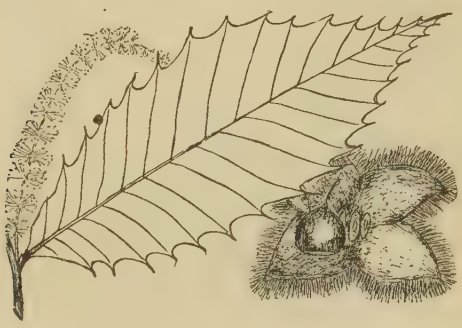
on older parts they are clustered at the ends of short twigs; they are long-ovate, narrowed at each end, coarsely toothed, bluish-green above, shining yellow-green beneath, silky hairy when young, 1′-5′ long. The

flowers are small, in dense round clusters. The fruit consists of two three-angled nuts in a prickly bur that splits open when frosted. There are several cultivated forms, notably the European Beech with very dark leaves, the Copper Beech with purplish leaves; and the Weeping Beech with drooping branches. In the north the beech is found on rich uplands but in its southern range in moist places from Nova Scotia and Ontario to Wisconsin and southward.

CHESTNUT (*Castenea dentata Borkh.*)

The Chestnut has been perhaps the most familiar of our trees because everyone enjoys gathering chestnuts in the fall. It is a stately tree, 40°-100° high, with large wide-spreading branches forming an ovoid top. The attractive foliage, especially when the tree is in flower, presents a picture scarcely equalled in beauty by any other tree. The twigs are shining yel-

low-green, often tinged with red or brown, and finally dark brown. The bark is gray-brown, cracking on old trunks into shallow, broad, flat ridges. The leaves are thin, oblong-lanceolate, narrowed at each end, teeth coarse and regular, smooth, dull green above, paler be-



neath, hairy when young, 3′-8′ long. The flowers are small, appearing in long erect white clusters in July. The fruit, one or more brownish nuts in a prickly bur that splits open when frosted; seed of nut very sweet. This was one of our most abundant and valuable trees, now largely destroyed in the east by a fungal disease. It will be reëstablished after the pest has spent itself. Found in rocky woods from southern Maine to Ontario and Michigan southward.

The Chinquapin (*C. pumilia Mill.*) is a shrub or small tree with thick small leaves, densely silvery-hairy beneath. It is found in dry woods and upland thickets from New Jersey to Indiana southward.

OAK (*Quercus L.*)

The Oaks form our largest and most common tree group and are among the most valuable of our timber trees. They are generally large trees with coarse branches and stiff twigs; buds covered with overlapping scales; the largest in clusters of two or more at the ends of the twigs. The bark is grayish or brownish, cracked on old trunks into scales or ridges. The leaves are variable in form but usually lobed or toothed; hairy when young. The flowers are minute and of two kinds. The pollen-bearing clusters appear in the spring as long, drooping tassels. The seed-producing flowers are in small compact clusters, each flower surrounded by numerous small scales. These scales become the cup and partly cover the acorn (see No. 1, below). There are 21 oaks within our range.

There are two main groups of oaks which can be recognized by their leaves. If the leaves or their lobes end in sharp points (bristle-tipped) they belong to the Red or Black Oak group; if without bristle tips they belong to the White Oak group.

Key to the Oaks.

a. Leaves or their lobes bristle-tipped. Bark dark, usually ridged. The Black or Red Oaks.
b. Leaf distinctly lobed.
c. Leaf green beneath.
d. Cup of acorn shallow or saucer-shaped.
e. Mouth of cup over 0.7″ wide.
Lobes of leaf usually contracting towards their tips. 1. Red Oak.
Lobes of leaf usually broadening towards their tips.
2. Southern Red Oak.

ee. Mouth of cup less than 0.7′ wide.
Acorn about as long as thick.
3. Pin Oak.
Acorn decidedly longer than thick.
2. Southern Red Oak.
dd. Cup of acorn top-shaped.
Scales of cup smooth. 4. Scarlet Oak.
Scales of cup hairy.
Inner bark bright orange.
5. Black Oak.
Inner bark yellowish.
6. Northern Pin Oak.
cc. Leaf gray or white-hairy beneath.
Large trees. Lobes of leaf lanceolate.
7. Spanish Oak.
Small trees or shrubs. Lobes of leaf short-triangular. 8. Scrub Oak.
bb. Leaf slightly lobed at top, or not lobed.
Leaf strongly widened at top.
Leaf brown-hairy beneath. Cup top-shaped.
9. Blackjack Oak.
Leaf smooth beneath. Cup saucer-shaped.
10. Water Oak.
Leaf not strongly widened at top.
Leaf smooth beneath. 11. Willow Oak.
Leaf hairy beneath. 12. Shingle Oak.
aa. Leaves or their lobes not bristle-tipped. Bark usually gray and scaly; rarely dark ridged. The White Oaks.
b. Leaf with short rounded lobes or coarsely toothed.
c. Stem of acorn lacking or very short.
Tall trees. Leaf with 16 or more teeth.
13. Chestnut Oak.
Small trees or shrubs. Leaf with 14 or less teeth. 14. Scrub Chestnut Oak.
cc. Stem of acorn conspicuous.
d. Stem of acorn equaling or shorter than petiole of leaf.
Bark whitish; flakey. 15. Basket Oak.
Bark dark, ridged and firm.
16. Rock Chestnut Oak.
dd. Stem of acorn much longer than petiole of leaf. 17. Swamp White Oak.
bb. Leaves with deep lobes.
c. Leaf hairy on veins beneath.
Mouth of cup fringed. 18. Mossycup Oak.

Mouth of cup not fringed.
Acorn nearly covered by cup.
19. Overcup Oak.
Acorn half or less covered by cup.
20. Post Oak.
cc. Leaf smooth and pale beneath. 21. White Oak.

1. **Red Oak** (*Q. rubra L.*). This is the most stately of our northern oaks, 50°-150° high with few, stout, spreading branches forming a narrow rounded

top. The twigs are shining and at first green, becoming reddish and finally dark brown. The bark, smooth gray-brown on young stems, later cracking into shallow, broad, flat ridges. The leaves thin with 5-11 triangular lobes pointing sharply upwards; each lobe having usually two or more bristle-tipped teeth; dull green above, paler and smooth beneath; 4′-9′ long. The acorn brownish red 0.5′-1′ long, cup saucer-shaped, flattish, with small, smooth, tightly fitting scales. The Northern Red Oak (*var. borealis*) differs in its larger and less deeply lobed leaves. The leaves remain green later in the fall and the bark remains smooth much longer. The acorn cup is deeper with coarser scales. The Red Oak is found from eastern Canada through south Quebec and Ontario to Minnesota and Kansas and southward.

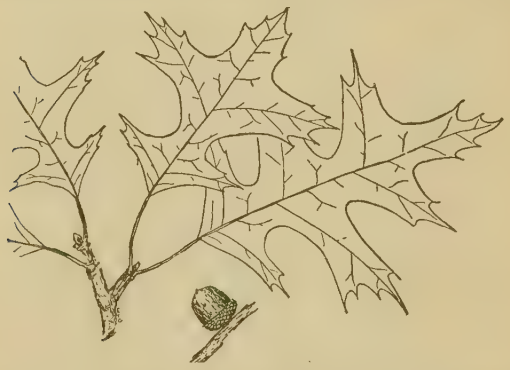
2. **Southern or Texan Red Oak** (*Q. schnecki Britt.*). This tree of the middle west and south some-

times quite equals the Red Oak in size. The twigs are hairy, green, becoming smooth, with red or yellow tinge, finally brown or gray. The bark, smooth and

gray on young stems; on old trunks broken into reddish-brown, plate-like ridges. Leaves bright green, shining above, paler and hairy in angle of veins beneath; lobes 5-9, broadening slightly towards their tips, each lobe with about three bristle-tipped teeth; 3′-8′ long. The acorn cup deeper than that of the Red Oak, with light brown or gray, woolly scales. Found mostly in bottom lands from North Carolina to Indiana and Iowa southward.

3. **Pin or Swamp Oak** (*Q. palustris Du Roy*). A fine forest tree 40°-100° high, easily recognized by the numerous slender lower branches often drooping nearly to the ground. These remain on the tree for years after they are dead and were used by the pioneers as staples (pins) in the construction of their buildings. The twigs are hairy and dark red, later smooth, shining green, finally gray-brown. Bark smooth, gray-brown often with reddish tinge, on old trunks sometimes cracking into shallow, firm ridges. Leaf resembles the Southern Oak but smaller; lobes

deep, 5-7 in number, sometimes broadening strongly toward their tips, having two or more bristle-tipped teeth; shining deep green above, hairy in angle of veins

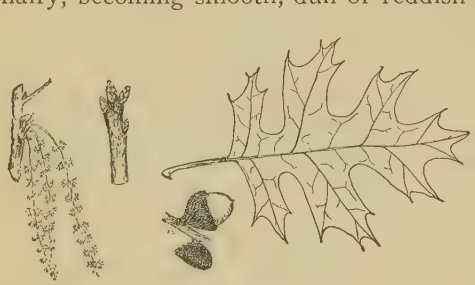


beneath; 2′-5′ long. Acorn nearly round, about 0.5′ thick, often with dark stripes. Found in low, wet ground from Massachusetts to Iowa, south to Virginia, Tennessee and Kansas.

4. **Scarlet Oak** (*Q. coccinia Muench.*). A fine forest tree 60°-80° high with foliage that almost glistens in the sunlight, and in the fall showing more brilliant

colors than the other oaks. The twigs are scurfy-hairy, soon becoming smooth and shining, light green, often with tinge of red or yellow, finally light brown. The bark, smooth and brown, cracking on old trunks into irregular, shallow, dark brown ridges (inner bark reddish). The leaves shining, bright green above, paler sometimes hairy in angles of veins beneath (very hairy when young), with 5-7 long, narrow lobes, some of which broaden strongly towards their tips and are provided with several bristle-tipped teeth; 3′-8′ long. The acorn ovoid and about half-covered by the top-shaped cup; the scale coarse, brown and smooth. Found in light, dry soils from southern Maine to Ontario, Minnesota, and Nebraska, southward to North Carolina and Missouri.

5. **Black Oak** (*Q. velutina Lam.*). A large forest tree with wide spreading branches forming an oblong, or in the open a rounded top. The twigs are at first scurfy-hairy, becoming smooth, dull or reddish brown,

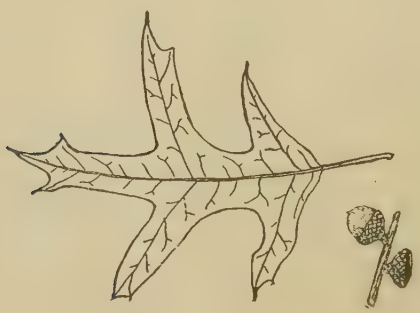


finally dark brown. The bark, smooth and brown on young stems, later cracking into rough, rounded ridges, sometimes nearly black and granular; inner bark bright orange. The leaves somewhat thick and leathery, lobes commonly long and broad with bristle-tipped teeth, middle pair usually with parallel sides; dark green and smooth above, dull yellow-green or brown,

usually with rusty hairs in angle of veins beneath (very hairy when young), 4′-12′ long. The fruit resembles that of the Scarlet Oak but the scales are usually hairy and turned outward at the mouth of the cup (when dry). Found in dry, gravelly uplands from southern Maine and Ontario to Iowa and southward.

6. **Northern Pin Oak** (*Q. ellipsoidalis Hill.*). A small western tree rarely exceeding 50° and sometimes shrubby. Resembles the Pin Oak in some respects but is related to the Black Oak in its fruit characters. Twigs at first reddish-brown and covered with matted hairs, later smooth and dark gray or brown. The bark nearly smooth, dull gray or brown, later becoming cracked into thin plates; inner bark light yellow. The leaves as in Pin Oak. The acorn somewhat cylindrical or roundish, 0.5′-0.7′ long; cup top-shaped with hairy, pale brown scales. Found on dry uplands from southern Michigan to Manitoba, southward to Iowa.

7. **Spanish Oak** (*Q. digitata Sudw.*). A tree of 20°-80° with stout spreading branches forming an open top. The twigs are very rusty or yellow hairy becoming red-brown or light gray. Bark pale or dark brown, cracking on old trunks into shallow, broad,



scaly ridges. Leaves exceedingly variable but often with 3-5 long, narrow, tapering lobes, the terminal one generally longest and often curved. The leaves shining dark green above, densely gray or rusty hairy beneath, teeth few; 3′-8′ long. The acorn roundish, about 0.5′ broad; cup flattish top-shaped, scales oblong, reddish with pale hairs. Found on poor, dry soils from southern Pennsylvania and New Jersey southward along the Atlantic States, and from southern Indiana and Illinois southward. The Swamp Spanish Oak (*Q. pagodaefolia Asche.*) is a smaller tree with leaves 5-13 lobed. Found in wet river bottoms from southern Indiana and Illinois southward.

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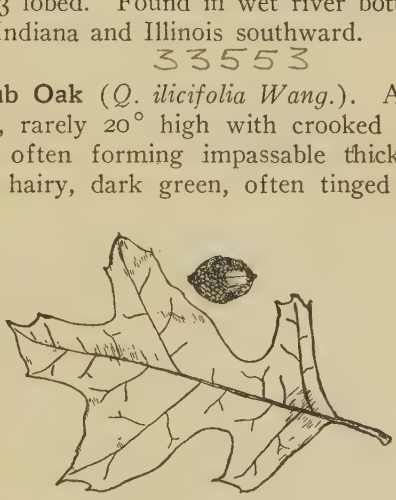
8. **Scrub Oak** (*Q. ilicifolia Wang.*). A shrub or small tree, rarely 20° high with crooked stems and branches, often forming impassable thickets. The twigs are hairy, dark green, often tinged with red,



becoming red-brown or gray, finally smooth, dark brown or nearly black. Bark smooth and dark, cracking on old stems into thin small scales. Leaves leathery, obovate, narrowed at base, with 3-7 short, bristle-tipped lobes, shining, dark green above, silvery hairy beneath, 2′-5′ long. Acorn ovoid, about 0.5′ long, very numerous on the twigs. Cup top-shaped, scales slightly hairy. Found on rocky hills and sandy barrens from

eastern Maine to Ohio and southward to North Carolina and Kentucky.

9. **Blackjack Oak** (*Q. marilandica Muench.*). A small tree, 20°-40° with short, twisted branches forming a compact and sometimes irregular top. The twigs scurfy-hairy, light brown, becoming reddish-brown,

finally smooth, brown or gray. The bark becomes very dark and cracks on old trunks into squarish plates. Leaves somewhat leathery, clustered at ends of twigs, broadly wedge-shaped, with 3 (rarely 5) short, bristle-tipped lobes or teeth towards the top; shining above, rusty hairy beneath, 4′-10′ long. Acorn roundish or oblong, and about half covered by the top-shaped, thick-rimmed cup, its scales rusty hairy. Found in sand and clay soils from Long Island to southern Minnesota and Nebraska southward.

10. **Water Oak** (*Q. nigra L.*). An attractive tree 60°-80° high with numerous slender branches forming a rounded top. The twigs are slender, smooth, reddish, becoming gray or brown. Bark nearly smooth, grayish, becoming darker and cracking into shallow, smooth ridges of firmly attached scales. Leaves variable but generally obovate with long taper-

ing base and wavy margin or slightly 3 lobed, bristle-tipped at top; frequently evergreen, shining on both sides, 2′-6′ long. Acorn small, roundish, in thin, saucer-

shaped cup. Much planted in the south and hardy in New England. Found on borders of swamps from Delaware south and from Kentucky and Missouri southward.

11. **Willow Oak** (*Q. phellos L.*). A tree of 60°-80° with slender ascending branches, forming a round top. Twigs smooth, red-brown, becoming dark brown or gray-brown. Bark nearly smooth, reddish brown;

on old trunks breaking into very shallow ridges. The leaves somewhat leathery, narrow-lanceolate, narrowed at each end, bristle-tipped, margin slightly wavy, shining, smooth on both sides, sometimes hairy beneath, 2′-5′ long. Acorn roundish, cup thin, flattish,

with hairy scales. Found in low ground from Long Island and from Kentucky and Missouri southward. Sometimes planted and several hybrids are recorded.

The Laurel Oak (*var. laurifolia*) has larger and broader leaves; elliptical or oblong, sometimes lobed at top. Found from New Jersey southward.

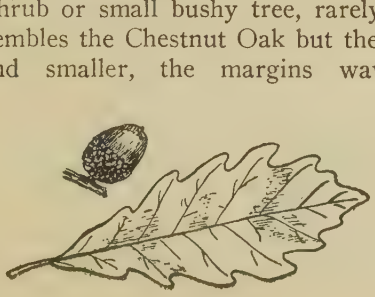
12. **Shingle Oak** (*Q. imbricaria Michx.*). An attractive forest tree with long symmetrical trunk and slender, horizontal, or rather pendulous branches, forming a narrow, rounded or irregular top. The

twigs at first hairy and dark green, become smooth and red-brown, finally dark brown. Bark nearly smooth, light brown and shining on young stems, becoming darker and cracking into shallow, firm ridges. Leaves elliptical to lanceolate, margin smooth but sometimes wavy, rarely somewhat 3 lobed, bristle-tipped, very shining dark green above, hairy beneath, 2′-6′ long. Acorn roundish, cup shallow and slightly top-shaped, scales slightly hairy and close-pressed. Found in rich woods and bottom lands from Pennsylvania westward to southern Wisconsin, eastern Nebraska; southward through the Appalachians.

13. **Chestnut or Yellow Oak** (*Q. Muhlenbergi Engl.*). A handsome tree occasionally 160° high with very broad base, tall, straight trunk and round top. The twigs slender, at first hairy and green, become

smooth, reddish, often with tinge of yellow, and finally gray or brown. The bark grayish, cracking into thin, silvery gray or white scales. Leaves elliptical, teeth regular and usually sharp-pointed, shining bright green above, pale and generally hairy beneath, 2′-8′ long. The acorn roundish, less than 1′ long, about half covered by cup of small, hairy scales; seed sweet. Found mostly in limestone soils from Vermont to Minnesota and southward.

14. **Scrub Chestnut Oak** (*Q. prinoides Willd.*). This is a shrub or small bushy tree, rarely 15° high. Closely resembles the Chestnut Oak but the leaves are obovate and smaller, the margins wavy-toothed;

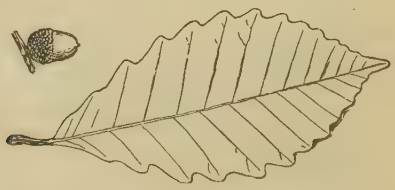


densely hairy beneath. Found in poor soils from Maine to Minnesota and southward.

15. **Basket or Cow Oak** (*Q. Michauxi Nutt.*). An attractive tree sometimes 100° high, with stout ascending branches forming a compact and roundish head. The twigs, at first hairy and dark green, become

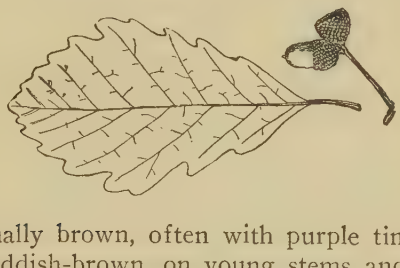
smooth, bright red or yellow-brown, finally gray. The bark smooth grayish on young stems, cracking into thin silvery or reddish gray scales on old trunks. Leaves long-obovate with regular roundish teeth, dark green above, pale to silvery woolly beneath, 4′-8′ long. Acorn usually 1′ or more long, cup deep saucer-shaped with hairy scales; seed edible. Found in borders of streams and swamps from southern New Jersey southward and from Indiana and Illinois southward.

16. **Rock Chestnut Oak** (*Q. prinus L.*). A short-stemmed tree with coarse, widely spreading branches forming an irregular top. The twigs are greenish purple becoming yellow or red-brown and finally dark



brown. Bark smooth, brownish, somewhat shining on young stems, later cracked into deep, hard ridges, dark brown, almost black. Leaves thick, obovate to lanceolate, margins scalloped with somewhat irregular teeth, dark green with yellow tinge above, pale and slightly hairy beneath, 4′-8′ long. Acorn less than 1.5′ long and about half covered by a firm cup with thickened, hairy scales; seed slightly sweetish. A common, rugged tree of rocky ridges from southern Maine to Ontario southward to Delaware and along the mountains.

17. **Swamp White Oak** (*Q. bicolor Wild.*). A tree of 50°-70° with coarse, wide spreading, often crooked branches forming a broad irregular top. The twigs shining green becoming light yellow- or red-



brown, finally brown, often with purple tinge. Bark smooth reddish-brown, on young stems and branches often peeling off in large thin plates; on old trunks broken into coarse, flat ridges covered by grayish-brown scales. Leaves obovate with coarse, blunt, short teeth or sometimes lobed, dark green above, usually pale and silvery-hairy beneath, 2′-8′ long. Acorn oblong, about 1′ long, cup hairy with stem 1′-4′ long. A tree of swamps from Maine and western Quebec westward to southern Minnesota and southward.

18. **Mossycup or Bur Oak** (*Q. macrocarpa Michx.*). A valuable tree occasionally more than 160°

high, with wide spreading branches well towards the top of a long trunk. The twigs are hairy, pale yellow-brown, becoming light gray or brown and sometimes with corky wings. The bark smooth gray or brown,

later cracking into deep ridges covered with irregular scale-like plates of a reddish-brown color. The leaves obovate, the upper portion wavy-margined and separated from the lower lobed portion by a deep sinus that sometimes nearly reaches the middle vein. Occasionally the margins are not lobed but wavy. Leaves shining green above, usually downy beneath, 5′-12′ long. The acorn 1.5′-2′ long, the cup hairy and more or less fringed at the mouth. Flourishes in rich bottom lands from Nova Scotia to Manitoba, southward to western Massachusetts and Kentucky.

19. **Overcup or Swamp Post Oak** (*Q. lyrata Walt.*). A tree usually with short trunk and small

branches forming a symmetrical round top. The twigs hairy, slender, green, often red-tinged, becoming smooth, yellowish or gray-brown. Bark smooth, gray or brown, breaking into thick plates, covered with thin, light gray or reddish scales. Leaves obovate with 7-9 irregular, triangular, or oblong lobes, with or without teeth; dark green above, white woolly beneath (rarely smooth), 5′-12′ long. Acorn roundish, 1′-2′ broad, nearly covered by cup. Grows in river swamps from southern New Jersey to Indiana and Missouri southward.

20. **Post Oak** (*Q. stellata Wang.*). A tree sometimes 90° high but usually much smaller, sometimes shrubby; with stout, spreading branches forming a close rounded top. The twigs woolly, brownish, be-

coming smooth and darker. The bark brownish, cracking into deep, broad, oblong plates. Leaves leathery, with 3-7 irregular lobes, the upper ones much larger, often flattened and notched at their tips, dark green and rough above, grayish or brownish hairy beneath, 4′-8′ long. Acorn ovoid, 1′ or less long, cup flat or top-shaped, scales usually hairy. This is an exceedingly variable tree and several forms are reported. It is found in dry, rocky or sandy districts from Massachusetts to Pennsylvania and Nebraska southward.

21. **White Oak** (*Q. alba L.*). One of our finest and most valuable trees. This oak with its short trunk and large, wide spreading branches is a familiar sight in the open country. The twigs are hairy, light reddish-green, becoming smooth, bright red and finally

light gray. The bark is gray or brown on young stems, cracking into thin gray or whitish scales, and on old trunks broken into shallow ridges covered by flat, oblong scales. Leaves obovate and usually deeply divided into 3-9 coarse oblong lobes, some of them often having smaller lobes at their tips; bluish green above, pale beneath, 4′-9′ long. Acorn less than 1′ long in a cup of hairy, united scales. The leaves of this oak are variable and the numerous hybrids add to the difficulty. Found in a variety of situations from Maine to Ontario and Minnesota southward.

ELM (*Ulmus L.*)

The elms are for the most part trees with straight trunks and slender branches, wide spreading and sometimes drooping. The bark is rough, light brown or grayish; the buds chestnut brown, scaly, smooth or hairy. The leaves are in two rows on the twigs, elliptical to obovate, often unequal at base, and toothed. The flowers are minute, in small clusters. The fruit is a small, winged nutlet (see No. 5, below). There are many cultivated varieties of elms.

Key to the Elms.

Twigs smooth or nearly so.
  Branches without corky wings. 1. American Elm.
  Branches often with corky wings.
    Leaf ovate to lanceolate. 2. Winged Elm.
    Leaf elliptical to obovate. 3. September Elm.
Twigs hairy.
  Branches often with corky wings. 4. Rock Elm.
  Branches without corky wings. 5. Slippery Elm.

1. **American or White Elm** (*U. americana L.*). This familiar tree with straight trunk and wide spreading and drooping branches sometimes attains a height of 150°. The twigs are slender, green, smooth (sometimes hairy), soon becoming reddish brown. The bark grayish, cracking into broad, flat, scaly ridges. The leaves obovate to elliptical, abruptly narrowed to a sharp tip, usually unequal at the base, often double-toothed, smooth or roughish above, pale and sometimes hairy beneath, 2′-6′ long. Margin of wing of nutlet hairy. Prefers moist soil and is found from Newfoundland to Manitoba and southward.

The English Elm (*U. campestris L.*) resembles the American Elm but has irregular, non-drooping branchlets; the leaves are also rougher on the upper side.

2. **Winged Elm. Wahoo** (*U. alata Michx.*). A small tree with short, straight branches forming a narrow, rounded top. The twigs are green, smooth or

slightly hairy, soon becoming reddish brown or gray and developing two thin, corky wings. The bark thin, light reddish brown, becoming cracked into shallow,

irregular flat, scaly ridges. Leaves leathery, ovate-oblong, double-toothed, smooth above, hairy beneath, 1′-3′ long. Fruit hairy. Usually found in dry uplands from Virginia to southern Indiana, Illinois, and Kansas southward.

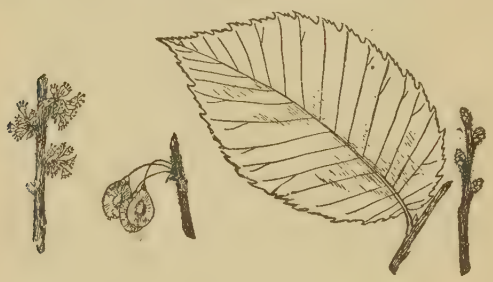
3. **September or Southern Elm** (*U. serotina Sarg.*). A tree 40°-60° high with small, spreading branches forming a broad, symmetrical top. The twigs usually smooth, reddish-brown, becoming gray-brown and often developing 2-3 thick, corky wings. Bark light brown, slightly ridged and scaly. Leaves elliptical to narrowly obovate, shining light green above, hairy on veins beneath, 2′-3′ long. Fruit fringed with long, white hairs. Flowers appear in September. Found locally on hills and river banks; eastern Kansas and Tennessee southward.

4. **Rock Elm** (*U. thomasi Sarg.*). The trunk is tall and straight with short, stout branches forming a narrow top. The twigs stiff, velvety, becoming smooth,

red-brown, finally brown or gray. They often develop three or four irregular, thick, corky wings. Bark gray or gray-brown, cracking on old trunks into coarse,

irregular, scaly ridges. Leaves obovate to elliptical, double-toothed, shining dark green above, paler and soft-hairy on the simple straight veins beneath, 2′-4′ long. Fruit is hairy. Found on gravelly and clay uplands and rocky river banks, from western Quebec through Ontario to Michigan and Wisconsin, south to Connecticut and northern New Jersey, west to Missouri and Nebraska.

5. **Slippery Elm** (*U. fulva Michx.*). A tree 40°-70° high with short trunk and spreading branches forming a flat and rather irregular top. The twigs



are rough, hairy, green, becoming brown or gray, often with tinge of yellow or red. Bark dark or red-brown, becoming cracked into rough ridges; inner bark white and very mucilaginous. Leaves ovate-oblong, pale, rusty-green, very rough above, hairy and often rough beneath, fragrant when dried, 1′-7′ long. Fruit with smooth wing and hairy center. Grows on rocky hillsides and river banks from Quebec to North Dakota and southward.

WATER ELM (*Planera aquatica Gmel.*)

A small tree rarely exceeding 30° with short trunk and slender spreading branches forming a broad, flat top. It is very suggestive of the elms; the twigs slen-

der, reddish-brown, becoming dark red and finally gray. Bark thin, light brown or gray; cracks into large loose scales, exposing the red-brown inner bark. The leaves resemble those of the elms, being nearly smooth, dark green above, paler beneath, 1′-3′ long. Flowers as in the elm, but the fruit consists of an elongated nutlet with irregular, soft outgrowths. Found in swamps from Indiana and Illinois southward.

HACKBERRY (*Celtis occidentalis L.*)

A shrub or small tree though sometimes 60°-80° high. The trunk is short with numerous slender branches, horizontal or slightly drooping, which form a wide, flattened top. Twigs slender, usually smooth,

light green becoming reddish-brown. Bark smoothish, light brown, becoming warty or coarse ridged. Leaves ovate, usually uneven at base, teeth sharp, sometimes lacking, light green and usually smooth above, paler and somewhat hairy beneath, 2′-4′ long. Flowers small, greenish, solitary or few clustered. Fruit cherry-like, on long stem, dark purple, sweet, lasting through the winter, 0.4′ broad. This tree is variable in nearly all its characters. Found on rocky hills and riverbanks from western Quebec to North Dakota and southward.

Several forms are recognized, as: *C. Crassifolia Lam.,* with hairy twigs and harsh, often heart-shaped leaves, and *C. canina Raf.,* with leaves narrowed at the base and with long, narrow tips.

The Sugarberry (*C. mississippiensis Spach.*). This small tree resembles the Hackberry, but the leaves are lanceolate with long, narrow tips and rounded or narrowed bases. They are also thin, smooth, and without teeth as a rule. The fruit is dark orange red. Found from southern Indiana and Illinois southward.

MULBERRY (*Morus L.*)

The Mulberries are small trees with wide spreading branches, rough, gray or brown bark, and milky juice. The leaves are coarsely toothed. The flowers are small and appear in the late spring in long, drooping clusters. The fruit is sweet, white or purple, in blackberry-like clusters.

1. **Red Mulberry** (*M. rubra L.*). A tree of 20°-40° with short trunk and smooth, spreading branches forming a dense, broad, rounded top. The twigs are usually hairy, greenish gray, often with tinge of red or

yellow, becoming smooth and brownish. Bark reddish-brown becoming ridged on old trunks and broken into irregular, long, scaly plates. Leaves ovate, base usually heart-shaped, margins coarsely toothed, sometimes 2-7 lobed, dark green above and usually roughish, hairy beneath, 3′-8′ long. Fruit dark purple. Found in river valleys and on low hills, from western New England to Ontario, North Dakota and southward. It is much cultivated.

2. **White Mulberry** (*M. alba L.*). An introduced tree escaped from cultivation from New England and

Ontario southward. It resembles the Red Mulberry, but the bark is light brown and broken on old trunks

into coarse ridges. The leaves are smooth and shining, light green, sometimes lobed, 2′-5′ long. Fruit white or pinkish.

PAPER MULBERRY (*Broussonetia papyrifera Vent.*)

A small tree with short trunk, broad, round top, and milky juice. The twigs are stout, hairy and green, becoming gray. Bark smooth, gray-brown, cracking into

a network of firm and often twisted ridges. Leaves ovate, thin, coarsely blunt-toothed, sometimes with two or many lobes, harshly rough above, pale and hairy beneath, 4′-8′ long. The pollen-bearing flowers appear in the late spring in long, drooping clusters. The seed-bearing flowers are in small, round clusters and form a reddish, hairy fruit 1′ or less broad. This is a cultivated tree but has escaped from New York southward.

OSAGE ORANGE (*Maclura pomifera Sch.*)

A tree of 40°-60° with stout, erect, spreading branches forming a rounded, open top. The twigs are hairy, green, becoming smooth, light brown with yellow tinge, and often developing sharp spines. The

bark is broken into deep, irregular ridges of an orange-brown or dark-gray color. Leaves ovate-lanceolate, toothless, shining, dark green, 2′-6′ long. The pollen-bearing flowers are in long, drooping clusters; the seed-bearing flowers in round clusters; they form a yellowish-green orange-like fruit 6′ or less broad. Often planted and escaped in many localities, especially in the east.

MAGNOLIA (*Magnolia L.*)

Trees with smooth, grayish or brownish bark sometimes becoming scaly or ridged. The leaves are large, toothless, sometimes with two lobes at base. The flowers are very large, white or pinkish, solitary at the end of stiff branchlets. Fruit conelike, fleshy and reddish. Cultivated in many varieties.

Key to the Magnolias.

Leaves without lobes at base.
  Leaf 2′-6′ long. 1. Sweetbay.
  Leaf 6′-8′ long. 2. Cucumbertree.
  Leaf 8′-24′ long. 3. Umbrella Magnolia.
Leaves with ear-like lobes at base.
  Leaf white beneath. 4. Bigleaf Magnolia.
  Leaf light green beneath. 5. Fraser Magnolia.

1. **Sweetbay. Swamp Magnolia** (*M. virginiana L.*). A small tree or shrub with small, erect, somewhat spreading branches forming a narrow, rounded

top. The twigs hairy, bright green becoming smooth, red-brown and finally gray. Bark usually smooth, light gray or nearly white, becoming gray and sometimes wrinkled or scaly on old trunks. Leaves oblong

to elliptical, shining green above, pale or whitish beneath (silky hairy when young), 2′-6′ long. Flowers white, very fragrant, roundish, 3′ or less broad. Fruit red, smooth, 2′ or less long. Found in swamps from eastern Massachusetts southward along the coast and extending into Pennsylvania and central North Carolina.

2. **Cucumbertree** (*M. acuminata L.*). A slender forest tree sometimes 90° high with spreading branches forming a pyramidal top. The twigs are bright reddish brown becoming gray. Bark grayish brown to

dark brown, broken on old trunks into scaly ridges. Leaves thin, oblong-ovate, slightly hairy beneath (very hairy when young), 6′-8′ long. Flowers greenish yellow, bell-shaped, about 2′ long. Fruit red, cucumber-like, 2.5′ long or less. Found near streams from western New York and Ontario to Illinois southward.

3. **Umbrella Magnolia** (*M. tripetala L.*). A small tree often with inclined trunk and stout, twisted branches forming an irregular open top. Twigs shining, greenish, smooth, becoming reddish-brown and finally gray. Bark smooth, light gray, roughened by small sharp projections. Leaves in umbrella-like clusters at the tips of twigs, oblanceolate, thin, smooth

(velvety when young), 8′-24′ long. Flowers white, cup-shaped, unpleasant odor. Fruit rose-colored, 4′

long or less. A tree much cultivated and found wild in ravines and swamps from southern Pennsylvania along the Appalachian Mountains.

4. **Bigleaf Magnolia** (*M. macrophylla Michx.*). This small tree differs from the Umbrella Magnolia in that its smooth, light gray bark breaks into small scales and the huge leaves, clustered at the ends of twigs, have

two ear-like lobes at the base, white-hairy beneath, 1°-3° long. Flowers creamy white, purple at base, fragrant, 8′-12′ broad. Fruit roundish, bright rose, 2′-6′ long. A tree unsurpassed in our range in the size of leaf and flower. Found in wooded valleys from central North Carolina and Kentucky southward.

5. **Fraser or Mountain Magnolia** (*M. fraseri Walt.*). This small tree differs from No. 4 in that its leaves are smooth, pale green beneath (not white hairy) 8′-18′ long; flowers cream-white, fragrant, 5′-10′ broad. Fruit cylindrical, rose red, 5′ long or less. Found along mountain streams from northeastern Kentucky and West Virginia through the mountains southward.

TULIP TREE. YELLOW POPLAR. WHITE-WOOD (*Liriodendron tulipifera L.*)

Perhaps the most stately tree of our range, sometimes reaching a height of 200° with a stem as regular as though turned on a lathe and frequently showing 50°-100° of trunk without a branch. The twigs are stout, yellow-green, becoming shining red-brown and

finally gray. The bark is smooth, brownish gray, becoming cracked into a regular network of shallow, firm ridges; on old trunks broken into deep, rough ridges. Leaves very smooth and shining with a broad notch at the tip, usually 4 lobed, 2′-8′ long. Flowers tulip-like, green-orange, 1′-3′ deep. Fruit cone-like, hanging on through the year, 2′-3′ long. This magnificent tree is found in rich woods from Massachusetts westward to Ontario and Wisconsin and southward.

AMERICAN PAWPAW (*Asimia triloba Dunal.*)

A small tree or shrub with short stem and straight, spreading branches. Twigs smooth or rusty hairy, light red-brown. Bark dark gray or brown, smooth, sometimes slightly ridged and often white-blotched.

Leaves thin, obovate, evenly narrowed to base, smooth (hairy when young), 4′-12′ long. Flowers green, hairy, becoming dull red, about 2′ broad. Fruit banana-like, greenish yellow to dark brown, 2′-6′ long, sometimes edible. Grows in moist soil, often forming dense thickets, from New Jersey to southern Ontario westward to Nebraska and southward.

SASSAFRAS (*Sassafras variifolium Ktze.*)

A small tree, though occasionally 100° high, with stout, crooked branches forming a flat top. The twigs are spicy, at first hairy, yellow green, soon becoming bright green, shining and often tinged with red, finally reddish brown. Bark shallow-ridged on young stems becoming broken on old trunks into deep, rough ridges. Leaves ovate to obovate, lobed or unlobed, smooth (very hairy when young), 2′-6′ long. Flowers small, greenish yellow, in loose, drooping clusters. Fruit small, cherry-like, dark blue. Grows in rich well-

drained soils from southern Maine and Ontario to Kansas and southward.

SPICEBUSH (*Benzoin aestivale Nees.*)

A spicy shrub or small bushy tree found in moist soil and along streams. Bark smooth and light brown on the twigs; dark brown and nearly smooth on the

stems. Leaves thin, obovate, smooth, pale beneath, 2′-5′ long. Flowers minute, bright yellow, in dense clusters, appearing before the leaves. Fruit a small brilliant red berry.

WITCH-HAZEL (*Hamamelis virginiana L.*)

A shrub or small tree with short stem and crooked, spreading branches forming a broad, open top. Twigs

hairy becoming smooth, light yellow-brown, finally brown. Bark light brown, nearly smooth, becoming scaly on old trunks. Leaves obovate to roundish, unequal at base, margin irregularly wavy or coarsely

toothed, usually smooth above, hairy on veins beneath, 2′-6′ long. Flowers in yellow clusters, appearing as leaves begin to fall. Fruit a woody, hairy pod, splitting into two parts when the flowers appear. Common in moist woods and borders of woodlands from Nova Scotia and Ontario to Minnesota and southward.

SWEETGUM (*Liquidambar Styraciflua L.*)

A straight stemmed tree, 40°-80°, with regular spreading branches forming a narrow top. Twigs

hairy, becoming smooth, light yellow or reddish brown, sometimes developing one or more corky wings. Bark dark gray becoming deep scaly-ridged on old trunks. Leaves star-like with 5-7 regular, narrow lobes, 2′-6′ broad. Flowers greenish and very small; the pollen-bearing ones in erect clusters 2′-3′ long, the seed-bearing ones in round clusters on a long, drooping stem. Fruit a prickly ball 1′ or more broad, often hanging on the tree during the winter. Found in wet soils from southern Connecticut to Illinois and southward.

PLANETREE. SYCAMORE (*Platanus occidentalis L.*)

One of our largest trees, 50°-80° high, sometimes 175°. The massive, wide-spreading branches form a very broad and irregular top. Twigs green, hairy, becoming dark yellow-brown, smooth and finally gray.

Bark reddish brown or gray, cracking off on young stems and large branches in large, irregular, thin patches, thus showing the inner bark in white, greenish or yellow-gray colors. On old trunks the bark breaks into coarse, scaly ridges of a dark brown color.

The leaves roundish with rather heart-shaped base, margins with 3-5 short, sharp-pointed lobes, usually with a few teeth, 4′-9′ wide. Flowers in round clusters on long stem. Fruit a round, green ball, becoming brown, 1′ or less broad. Found along borders of waterways from southern Maine and Ontario to Nebraska and southward.

AMERICAN MOUNTAIN ASH (*Sorbus Americana Marsh.*)

One of our most attractive small trees with slender, spreading branches forming a narrow, rounded top. The twigs stout, hairy, red-brown, becoming smooth

and dark brown. Bark smooth, gray-brown, breaking into plate-like scales on old trunks; inner bark fragrant. Leaves 6′-9′ long, composed of 9-17 elliptical leaflets, smooth, fine-toothed, above middle, 1′-3′ long. Flowers white, in flat clusters, 3′-5′ broad. Fruit berry-like, brilliant coral red, hangs on during the winter. Found in moist, rocky woods and swamp borders from eastern Canada to Maine, southward to Iowa, and in the mountains to North Carolina. Often cultivated.

The cultivated Rowan or European Mountain Ash (*S. Aucuparia L.*) has 9-15 blunt leaflets, hairy, especially beneath. It sometimes escapes.

PEAR (*Pyrus communis L.*)

A small, pyramidal tree that often escapes from cultivation. Twigs short, sometimes ending in spines. Bark smooth, reddish brown, cracking on old trunks into gray-brown oblong scales. Leaves ovate-elliptical

to obovate, teeth very fine or lacking; smooth above and beneath (downy when young); petiole equal to or longer than leaf-blade. Flowers white, in showy clusters on short branches. Fruit a pear with gritty flesh.

APPLE. CRAB (*Malus Hill*)

Small trees with rather crooked, spreading branches. Bark smooth, brownish, becoming scaly. Twigs sometimes ending in spines. Leaves mostly ovate, generally toothed. Petiole usually shorter than leaf-blade. Flowers white or rose colored, in showy clusters. Fruit an apple; flesh not gritty. Cultivated in many varieties for fruit, flowers and foliage.

Key to the Species of Apple.

Leaf not hairy when mature.
  Leaf base rounded or heart-shaped. 1. Sweet Crab.
  Leaf base narrowed. 2. Southern Crab.
Leaf hairy beneath.
  Leaf base rounded or heart-shaped. 3. Apple.
  Leaf base narrowed. 4. Prairie Crab.

1. **Wild Sweet Crab. Garland Tree** (*M. coronaria L.*). A small tree resembling the apple. Twigs woolly and white, becoming smooth, gray or red-brown, somewhat spiny. Bark light reddish brown, cracks into

shallow, flat, scaly ridges. Leaves ovate, thin, sharp-toothed, often with several small lobes, smooth beneath (velvety when young), 1′-4′ long. Flowers fragrant, rose colored. Fruit greenish yellow, waxy, fragrant, 1′-2′ broad. Found in thickets and open woods from Ontario to Nebraska and southward.

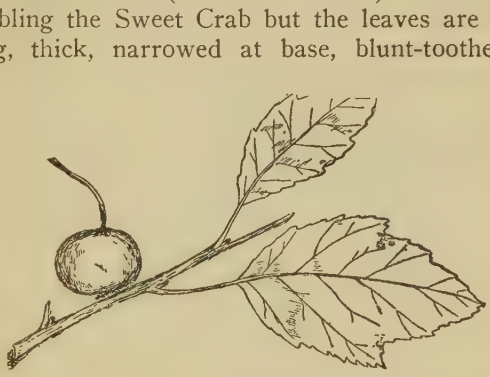
2. **Southern or Narrowleaved Crab** (*M. angustifolia Michx.*). An attractive tree rarely exceeding 25°, with stiff, spreading branches forming a broad, open top. Twigs hairy, becoming smooth and brownish,

with spine-like outgrowths. Bark gray or red-brown, broken into narrow, flat, scaly ridges on old trunks. Leaves elliptical-oblong, rather leathery, with or without teeth, shining, 1′-2′ long. Flowers pink, very fragrant. Fruit yellow-green, fragrant, 1′ or less broad. Found in river thickets from New Jersey to Illinois and Kansas southward.

3. **Apple** (*M. Malus Britt.*). This is the cultivated apple. The twigs are hairy, becoming reddish brown and finally smooth, gray-brown, often with spines. Bark smooth, gray-brown, cracking on old trunks into irregular, thin scales. Leaves ovate-oblong,

base rounded or heart-shaped, toothed, hairy beneath, 1′-2′ long. Flowers white or pinkish, in showy clusters. Often escaping.

4. **Prairie Crab** (*M. ioensis Britt.*). A small tree resembling the Sweet Crab but the leaves are mostly oblong, thick, narrowed at base, blunt-toothed and



often lobed, white woolly beneath. Found from Minnesota and Wisconsin southward.

The Soulard Crab (*M. soulardi Britt.*) is found with the Prairie Crab and is supposed to be a hybrid of it and some other form. Its leaves are wrinkled, irregularly scallop-toothed. Often cultivated.

CHOKEBERRY (*Aronia Med.*)

A group of shrubs or small trees of common occurrence in swamps and moist soil; beautiful in flower, fruit, and autumn coloration. They are upright plants with slender, dark brown stems and branches. Leaves ovate to obovate, fine-toothed. Flowers small, white or reddish, like the apple blossoms, in flat clusters. Fruit small, red, purple, or black, berry-like. Found from Wisconsin to Minnesota and southward.

Red Chokeberry (*A. arbutifolia Ell.*) has elliptical to obovate leaves, usually very hairy beneath, 1′-3′ long.

Fruit usually pear-shaped, red, about 0.3′ broad, 9 or more in a cluster.

Purple Chokeberry (*A. atropurpurea Britt.*) is similar, but the fruit is roundish, dark purple to black, about 0.4′ broad and 9 or less in a cluster.

Black Chokeberry (*A. melanocarpa Britt.*) has smooth leaves, fruit essentially black, usually shining.

SHADBLOW (*Amelanchier Medic.*)

Very attractive small trees or shrubs with slender, spreading branches forming a narrow or broad top. Bark smooth, sometimes scaly or ridged on old trunks.

Flowers white in loose, drooping clusters, appearing from March to April. Fruit berry-like, red to dark purple.

1. **Downy Shadblow. Shadbush** (*A. canadensis Med.*). A handsome shrub or tree, rarely 50° high, with numerous branches forming a narrow top. Twigs slender, light green, becoming red-brown (very hairy when young). Bark smooth, gray, becoming striped with reddish brown or nearly black, irregular vertical lines; on old trunks sometimes breaking into narrow, smooth or scaly ridges. Leaves ovate to obovate, base heart-shaped or rounded, fine sharp-toothed, hairy on veins beneath (woolly when young), 1′-4′ long. Fruit dry, bright red to dark purple. Grows on dry, open hills and woodlands from New England to Nebraska and southward.

2. **Alleghany Shadblow. Serviceberry** (*A. laevis Wieg.*). A similar tree, but the leaves are rounded at base, rarely heart-shaped, teeth coarser, smooth beneath

(somewhat hairy when young), 1′-3′ long. Fruit juicy, sweet. Found in moister localities from Newfoundland to Quebec and Wisconsin southward along the mountains.

3. **Roundleaf Shadblow** (*A. sanguinea Lind.*). A shrub or small, slim tree with smooth, light colored bark. Leaves broadly elliptical or roundish, teeth coarse and incurved, smooth above and beneath, 1′-3′ long. Fruit large, dark purple, juicy, sweet. Found from eastern Canada to Ontario and Minnesota and southward along the mountains.

HAWTHORN. THORN. HAW (*crataegus L.*)

A group of very attractive plants; shrubs or small trees; rather flat-topped, with branches usually crooked and thorny. Bark smooth brown or gray, becoming scaly. Leaves commonly ovate, toothed and often lobed. The flowers appear in early summer, in flat, showy clusters, generally white. Fruit resembles a small apple but with dry or mealy flesh and containing 1-5 nutlets; in shades of green, red, purple, yellow, blue and black. These plants belong largely to eastern North America and some 200 forms have been described. They are distinguished by the number and color of their stamens (the pollen organs), the number and markings of the nutlets, and the character of the leaves. To the beginner at least, the majority of them present a hopelessly intergrading group. Excellent keys and descriptions of the species will be found in the books mentioned on page 4. Four of these plants are shown on page 134, illustrating their variations. 1. Frosted Hawthorn. 2. Downy Hawthorn. 3. English Hawthorn. 4. Roundleaf Hawthorn.

PEACH (*Amygdalus L.*)

A small, low-branching tree with smooth, greenish twigs soon becoming reddish purple and finally gray-brown. Bark smooth, dark brown with short horizontal lines, becoming on old trunks rough scaly. Leaves lanceolate, long taper-pointed, sharply toothed, shining light green, rather drooping, 4′ long or less. Flowers in small clusters, pink, fragrant. The velvety skin of the fruit distinguishes the Peach from the next group. Escaped from cultivation in many localities.

PLUM AND CHERRY (*Prunus L.*)

A large group of small trees or shrubs, mostly with brownish red, smooth bark marked with horizontal lines which sometimes become conspicuous and roughened. The bark frequently cracks into thin strips or thick plates, or on old trunks becomes ridged. The twigs are slender, in some forms spiny, and the bark is bitter. Leaves generally elliptical or ovate and fine toothed. Flowers white, showy, in long or short clusters. Fruit a plum grooved on one side, with flat stone (pit); or a round cherry with round stone (pit). Numerous forms are cultivated for fruit, flowers, or foliage.

Key to the Plums and Cherries.

Fruit grooved, stone (pit) flattened. The Plums.
  Flowers several in a cluster.
    Leaf dull green, abruptly pointed at tip.
      Leaf with slender sharp teeth. 1. American Plum.
      Leaf with blunt teeth. 2. Canada Plum.
    Leaf shining, taper pointed.
      Leaf ovate to elliptical, teeth blunt. 3. Hortulan Plum.
      Leaf lanceolate, teeth sharp. 4. Chickasaw Plum.
  Flowers 1-3 in a cluster. 5. Black Thorn.
Fruit and stone (pit) rounded. The Cherries.
  Flowers and fruit in short clusters.
    Leaf smooth beneath.
      Leaf ovate to obovate. 6. Sour Cherry.
      Leaf roundish, fragrant. 7. Mahaleb Cherry.
      Leaf lanceolate, shining. 8. Pin Cherry.
    Leaf hairy beneath. 9. Mazzard Cherry.
  Flowers and fruit in long clusters.
    Leaf with fine sharp teeth. 10. Choke Cherry.
    Leaf with fine blunt teeth. 11. Black Cherry.

1. **American Plum** (*P. americana Marsh.*). A small tree or shrub with short trunk and widespreading, scrubby branches that are often spiny and drooping. Twigs smooth or hairy, bright green becoming yellow-brown and finally red-brown. Bark smooth, light or dark brown, cracking into thin, long scales.

Leaves obovate or elliptical, abruptly narrow-pointed, sharply toothed, dull green, somewhat rough above, nearly smooth beneath, 2′-4′ long. Fruit orange to bright red, less than 1′ broad, ripening in mid-summer or later. Found in thickets and on river banks from Connecticut to Montana and southward. Cultivated in several forms.

The Alleghany Plum. American Sloe (*P. alleghaniensis Port.*) is a straggling shrub or small tree with loose scaly bark and lanceolate leaves. Fruit dark purple with whitish coating, 0.5′ broad. Found in the mountains from central Pennsylvania to Virginia and North Carolina and also in southern Connecticut.

2. **Canada Plum** (*P. nigra Ait.*). A broad round-topped tree with twisted spiny branches, rarely 25° high. Twigs smooth or hairy, bright green becoming light or dark red-brown. Bark gray-brown, smooth, cracking into thick curved plates composed of papery layers and becoming very rough on old trunks. Leaves

broadly ovate. abruptly narrow-pointed, blunt-toothed, 2′-5′ long. Fruit orange-red or yellow, 1′ or more broad. Grows on river banks and waste lands from

Newfoundland through southern Canada to Minnesota, southward to Iowa, Pennsylvania, and southern New England. Cultivated in several varieties.

3. **Hortulan Plum** (*P. hortulana Bly.*). A small tree or shrub suggesting Nos. 1 and 2, but the twigs are usually without spines and the dark brown bark cracks into large thin scales or plates. Leaves ovate to

elliptical with long, slender tips, fine incurved, blunt teeth, shining green, 2′-6′ long. Fruit deep red, rarely yellow, 1′ or less broad, ripening in the fall. Found in low, moist soil from Indiana to Iowa southward. Sev-

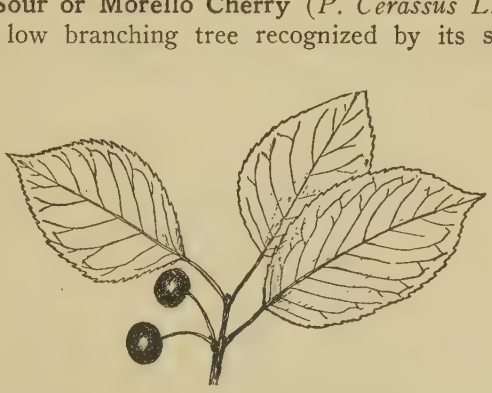
eral of the best plums have been derived from this plant.

4. **Chickasaw Plum** (*P. angustifolia Marsh.*). Differs from the Hortulan Plum in its usually spiny branches and narrow lanceolate leaves, minutely sharp-toothed, 1′-3′ long. Fruit red or yellow, about 0.5′ broad, ripening in summer. Found in sandy soil from New Jersey west to Kansas and southward.

5. **Black Thorn** (*P. spinosa L.*). This is an introduced plant found in waste places from the New England States to Pennsylvania and New Jersey. Branches spiny, bark smooth and nearly black; leaves obovate, sharp-toothed, downy beneath, 2′ long or less. Fruit black with whitish coating.

Three of the following species are introduced cherries which often escape from cultivation. (See 6-7-9.)

6. **Sour or Morello Cherry** (*P. Cerassus L.*). A small, low branching tree recognized by its smooth



red-brown bark, marked with horizontal lines. On old trunks the bark cracks into out-turned gray brown scales, becoming rough. Leaves thin, ovate to obovate,

fine-toothed, smooth above and beneath (resinous when young), 1′-4′ long. Fruit red, sour.

7. **Mahaleb or Perfumed Cherry** (*P. Mahaleb L.*). A shrub or small tree. Bark nearly smooth and light

brown. Leaves roundish with very fine blunt teeth, smooth, fragrant, 1′-2′ long. Fruit shining, black, bitter.

8. **Pin, Red, or Bird Cherry** (*P. pennsylvanica L.*). A small tree with slender, horizontal branches forming a rather narrow top. Twigs shining, bright red becoming brownish. Bark thin, smooth, red-

brown, with horizontal marks, cracking horizontally into papery strips. Leaves thin, oblong-lanceolate, fine incurved teeth, shining, smooth, 3′-6′ long. Fruit light red, very sour, 0.2′ broad, ripens in August and September. Found in open woods and clearings through-

out Canada, south to Iowa, Pennsylvania and along the mountains to North Carolina and Tennessee.

9. **Mazzard. Sweet Cherry** (*P. Avium L.*). This is a large, rather pyramidal tree. Bark deep red-brown with conspicuous horizontal lines, cracking horizontally on old trunks into thick curled strips and finally

becoming somewhat ridged. Leaves thick, obovate, abruptly narrow-pointed, coarsely toothed, hairy on veins beneath, 2′-5′ long. Fruit dark red, rarely yellow, sweet.

10. **Choke Cherry** (*P. virginiana L.*). A shrub or small tree common throughout our range. Twigs

smooth, shining, light brown or reddish brown. Bark smooth, dull brown or grayish, becoming cracked on old trunks into irregular curved scales; inner bark with unpleasant odor. Leaves thin, obovate to ovate, abruptly pointed, sharp slender teeth, smooth above and beneath, 2′-4′ long. Fruit in drooping clusters, yellowish to nearly black, about 0.3′ broad, puckery, sweeter after frost.

11. **Black Cherry** (*P. serotina Ehrh.*). This is the most valuable of our native cherries and the largest, sometimes exceeding 100°. Twigs greenish with tinge of yellow, becoming bright red, finally red-brown. Bark smooth, reddish brown with horizontal markings,

cracking on old trunks into thick, irregular, scaly plates, dark reddish brown or grayish. Leaves rather leathery, ovate, oblong to elliptical, taper-pointed, fine incurved blunt teeth, smooth and shining above, 2′-6′ long. Fruit in long clusters, dark red to black, sweetish, 0.4′ broad or less. Flourishes from Nova Scotia to North Dakota and southward.

REDBUD, JUDAS TREE (*Cercis canadensis L.*)

A small, highly ornamental tree with rather irregular branches forming a flat top. Twigs slender, shining, light brown becoming dull gray brown. Bark smooth, light brown or gray, cracking later into oblong, red-

brown scaly plates. Leaves roundish, heart-shaped, dark green and smooth above, paler and sometimes hairy on veins beneath, 2′-5′ long. Flowers pinkish, pea-like, in small clusters on the trunk and branches before the leaves appear. Fruit a pod, 2′-3′ long. Found in rich soil from Ontario to Minnesota southward. Often cultivated.

HONEYLOCUST (*Gleditsia triacanthos L.*)

A large tree, sometimes 100°, the branches and trunk often armed with large branched thorns. The branches usually divide into slender, somewhat pendulous branchlets, forming a broad top. Twigs smooth, shining, greenish red becoming brown. Bark smooth, dark gray-brown, cracking on old trunks into coarse ridges, covered with firm curved scales. Leaves 6′-8′ long, composed of many long-ovate leaflets which are

smooth, dark green above, often hairy beneath (hairy when young) slightly toothed, 0.5′-1′ long. Flowers minute, greenish, in drooping clusters. Fruit a leath-

ery, flat, many-seeded pod, brown, often twisted, contains a sweetish pulp between the seeds, 8′-18′ long. Found in rich woods from Ontario to Nebraska and southward. Often cultivated.

The Waterlocust (*G. aquatica Marsh.*). A low-branching tree with stout, often crooked, branches. Bark smooth, gray or red-brown becoming roughened and sometimes scaly. The thorns are more frequently flattened and unbranched, and the fruit is small, usually one seed without pulp, 1′-2′ long. Found in swamps from southern Indiana and Illinois to North Carolina and southward.

KENTUCKY COFFEETREE (*Gymnocladus dioica Koch.*)

A large forest tree with coarse branches developed near the ground or at a height of 50°-80°. Twigs slightly hairy, stout, very crooked and blunt-tipped, greenish brown. Bark gray or brown, cracking into coarse, flat ridges covered with thick firm scales.

Leaves 1°-3° long, composed of many ovate leaflets 1′-2′ long. Flowers whitish, in clusters. Fruit a woody pod with sweet pulp about the seeds, 4′-10′ long, hang-

ing in clusters during the winter. Found in rich soil from southern Ontario to Minnesota southward. Often cultivated.

YELLOW-WOOD (*Cladrastis lutea Koch.*)

A beautiful, small tree with wide-spreading branches (slightly drooping) forming a broad top. Twigs slen-

der, hairy, green-brown, becoming shining, red-brown, finally darker brown. Bark smooth, gray or light brown often blotched and on old trunks wrinkled. Leaves 8′-11′ long, composed of 5-11 ovate to roundish leaflets, thin, nearly smooth, 3′-4′ long. Fruit a smooth pod 2′-4′ long. Flowers white, fragrant, pea-like, in drooping clusters, 4′-20′ long. Found in rich woods from western North Carolina through Tennessee and Kentucky to Missouri. Often planted.

COMMON LOCUST (*Robinia Pseudoacacia L.*)

A tall, slender tree with erect, rather crooked branches, forming a narrow cylindrical top. Twigs hairy, green, becoming smooth and red-brown. The

smooth, brownish bark of young trees becomes broken into a coarse network of deep ridges on old trunks. Leaves 6′-14′ long, composed of 7-21 leaflets, elliptical or ovate, thin, nearly smooth, 1′-2′ long. The petiole has two bristles at its base which often persist for years and develop into hard spines. Flowers white, very fragrant, pea-like, in drooping clusters, 4′-8′ long. Fruit a small, flat pod, 2′-4′ long. Found from Pennsylvania southward along the mountains; also in the Ozark Mountains.

The Clammy Locust (*R. viscosa Vent.*) is a small tree, having sticky twigs and petioles. Flowers pink,

nearly odorless; pod roughish. Both of these forms are cultivated and several forms have been derived from them.

COMMON PRICKLY-ASH (*Zanthoxylum americanum Mill.*)

A shrub or small tree with prickly stem and branches. Twigs gray with bluish tinge. Bark gray, nearly smooth. Leaves composed of 5-11 ovate-lanceolate,

deep green leaflets, 1′-2′ long. Flowers minute green-yellow, in small groups, before the leaves appear in the spring. Fruit a very small black pod. Found from western Quebec to Ontario and Minnesota and southward.

HOPTREE (*Ptelia trifoliata L.*)

A shrub or small tree with slender trunk and spreading branches. Twigs hairy, soon becoming smooth or somewhat roughened and brown. Bark nearly smooth, dark gray. Leaf usually composed of three dark green ovate leaflets with smooth or fine-toothed margins, 4′-6′

long. Flowers small in branching clusters. Fruit flat, about 1′ broad, with broad-winged margin. Found in

rocky places from Long Island to Ontario and Minnesota southward. Often cultivated.

AILANTHUS (*Ailanthus glandulosa Desf.*)

A handsome tree with large, wide-spreading branches. Twigs coarse, hairy, yellow-green becoming smooth, reddish brown. Bark grayish and nearly

smooth, becoming marked with vertical, light-colored cracks and on old trunks broken into diamond-shaped spaces. Leaves 1°-3° long, composed of 11-41 leaflets, long-ovate, generally with few blunt teeth at base of leaflet. Flowers very small but in large, branching clusters. Fruit in large, showy clusters, each one hav-

ing two twisted wings; sometimes has unpleasant odor. An introduced tree, now common in many sections.

AMERICAN SMOKETREE (*Cotinus americanus Nutt.*)

An attractive shrub or small tree with widely spreading branches. Twigs smooth, at first purplish, later passing through shades of green to red or orange-brown. Bark smooth, gray, cracking into long, thin

scales. Leaves elliptical to obovate, smooth, dark green, 3′-6′ long. The flowers and fruit are minute, in large, loose clusters, the stalks long and hairy, giving a feathery or smoky appearance to the clusters. Found on rocky banks of streams from Tennessee to Kansas and southward. Resembles the cultivated European Smoketree which has smaller, rounded, leathery leaves.

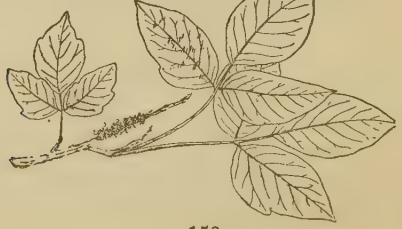
SUMAC (*Rhus L.*)

Shrubs or small trees with foliage attractive in summer and (in some forms) scarcely rivalled in the fall for richness of coloration. They usually have milky or resinous juice and some species are very poisonous. Leaves large, composed of many lanceolate or ovate leaflets, margins usually toothed and sometimes lobed. Flowers minute, greenish white, in compact or loose clusters. Fruit in reddish, cone-shaped clusters or in loose clusters of cream-white nutlets. There are several cultivated varieties.

Key to the Sumacs.

The first two species are poisonous.
- Leaf composed of three leaflets. 1. Poison Ivy.
- Leaf composed of several leaflets.
  - Leaf toothless or with few teeth.
    - Leaf not winged between leaflets. 2. Poison Sumac.
    - Leaf winged between leaflets. 3. Shining Sumac.
  - Leaf toothed.
    - Twigs brown, hairy. 4. Staghorn Sumac.
    - Twigs whitish, smooth. 5. Smooth Sumac.

1. **Poison Ivy** (*R. Toxicodendron L.*). A vine climbing over fences or about trees. Sometimes a low,



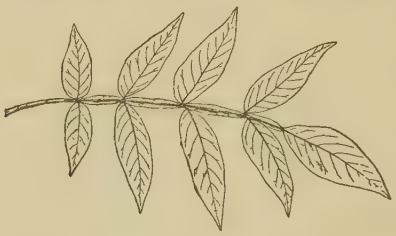
bushy shrub. Leaf composed of three ovate leaflets, usually toothless but sometimes toothed or lobed. Flowers very small in long clusters. Fruit roundish, cream-white nutlets about 0.2′ broad, in loose clusters. A common plant from Nova Scotia to Minneapolis southward.

2. **Poison Sumac** (*R. Vernix L.*). A shrub or small, low-branching tree. Twigs reddish brown changing to orange brown and finally to gray. Bark smooth, grayish, becoming roughened in horizontal lines on old trunks. Leaves 6′-16′ long, composed of

7-13 elliptical to obovate leaflets, toothless (rarely few toothed or lobed), 1′-6′ long. Fruit loose clusters of pale, yellow-white, shining nutlets. Found in swamps from western Maine to Minnesota and southward. Both Nos. 1 and 2 are poisonous to most people if even touched, causing burning inflammations. A paste of baking soda applied to the affected part is a first aid remedy.

3. **Shining Sumac** (*R. copallina L.*). Usually a shrub with stout, velvety, greenish red twigs becoming red-brown. Bark smooth, brownish, becoming roughened in horizontal lines and sometimes cracking into

papery scales. Leaf 6′-12′ long, composed of 9-21 somewhat leathery, shining leaflets, usually toothless, and with green, leafy outgrowths between each pair



of leaflets. Fruit in dense, hairy, red clusters. Found on dry hills from southern Maine to Minneapolis and southward.

4. **Staghorn Sumac** (*R. typhina L.*). A shrub or small tree often with crooked stem and a few coarse branches. Twigs pinkish, velvety, becoming green and

finally smooth and brownish. Bark dark brown, smooth, but rough-dotted becoming on old stems roughened in horizontal lines and often cracking into papery

scales. Leaves 1°-2° long, composed of 11-31 sharp-toothed leaflets. Fruit in dense, reddish, conical clusters. Found in poor soils from Nova Scotia to Ontario and South Dakota and southward.

5. **Smooth Sumac** (*R. glabra L.*). Resembles No. 4, but the twigs are smooth and covered with a bluish white coating; the bark lighter colored and grayish. The leaves are very whitish beneath. Forms with deep cut or with smooth-margined leaflets also occur. Numbers 4 and 5, or varieties of them are sometimes cultivated. Found in dry soils from eastern Canada to Ontario and Minnesota and southward.

HOLLY (*Ilex L.*)

Shrubs or small trees with slender ascending or spreading branches; found in swamps or moist ground. Bark smoothish, gray or brown. Leaf margin with or without teeth. Flowers minute, green or white, solitary or in clusters on the branchlets. Fruit small, berry-like, shining bright red, yellow, or black, containing 4-8 nutlets.

Key to the Hollies.

Leaves evergreen. 1. American Holly.
Leaves not evergreen.
  Nutlets of fruit roughish.
    Leaves mostly obovate. 2. Possumhaw.
    Leaves mostly elliptical. 3. Mt. Winterberry.
  Nutlets of fruit smooth. 4. Winterberry.

1. **American Holly** (*I. opaca Ait.*). A handsome tree with horizontal, sometimes drooping, branches forming a conical top. In the north sometimes a

shrub. Twigs finely rusty hairy, soon becoming smooth and pale brown. Bark light gray or yellowish brown, smooth and firm, sometimes becoming warty or

wrinkled. Leaves stiff, usually with spine-tipped teeth, somewhat shining, deep green, 2′-4′ long. Fruit a shining red berry, 0.3′ broad, remaining on branches through the winter. Found on moist soil near water, from Maine along the coast southward, and up the Mississippi River basin to Illinois and Indiana. The thoughtless and wasteful use of this plant for Christmas decorations is rapidly exterminating it. Every one should refuse to buy or to cut a piece of this tree.

2. **Possumhaw. Swamp Holly** (*I. decidua Walt.*). This is usually a shrub, rarely a straggling tree. Twigs smooth, silvery gray or tinged with yellow. Bark grayish, smooth, often mottled, sometimes warty. Leaves obovate, teeth rounded or lacking, hairy beneath on middle vein, 1′-3′ long. Fruit clustered on short stems, scarlet or orange red. Grows on borders of streams and swamps from Virginia, Illinois, and Kansas southward.

3. **Mountain Winterberry** (*I. monticolor Gray*). A shrub or small tree with short trunk and slender, spreading branches. Twigs smooth, light brown becoming dark gray. Bark light brown, smooth, becoming roughened with numerous warty outgrowths.

Leaves thin, elliptical to lanceolate, smooth, teeth sharp and short, 2′-6′ long. Fruit scarlet, nearly 0.5′ broad. Found in mountains from New York southward along the Alleghanies.

4. **Winterberry. Black Alder** (*I. verticillata Gray*). One of our most attractive swamp shrubs, rarely a small tree. Twigs smooth or slightly hairy, pale gray

or brownish. Bark smooth, gray-brown. Leaves elliptical to obovate, sharp or indistinctly toothed, hairy beneath, 1′-4′ long. Fruit clustered on twigs, bright red, rarely yellowish. Common from eastern Canada to Ontario and Wisconsin and southward.

5. **The Smooth Winterberry** (*I. laevigata Gray*). A shrub similar to the Winterberry, with leaves smooth, teeth lacking or very short. Fruit orange red, not clustered. Grows from Maine south, through the mountains to North Carolina and Kentucky.

WAHOO, BURNINGBUSH (*Euonymus atropurpureus Jacq.*)

A small tree or shrub with slender, often four-sided twigs, at first greenish, becoming purple-brown. Bark smoothish, gray often mottled, cracking on old stems into shallow ridges. Leaves opposite, ovate to elliptical, minutely toothed, 2′-5′ long. Flowers in long-

stemmed clusters, deep purple, nearly 0.5′ broad. Fruit a four-lobed pod in drooping clusters, splitting open in the fall, showing scarlet seed. Found from western New York to Southern Dakota and southward. Often cultivated.

The Spindletree (*E. Europaeus L.*) is a similar cultivated species that sometimes escapes. Leaves smaller, 1′-2′ long.

AMERICAN BLADDERNUT (*Staphylea trifoliata L.*)

A slender shrub, rarely 20° high. Twigs smooth, greenish, somewhat shining, becoming brown and

striped with whitish lines. Bark smooth, gray, striped with green or white. Leaves opposite, composed of three mostly ovate, narrow-pointed leaflets, smooth,

toothed, 1′-3′ long. Flowers white, in drooping clusters about 4′ long. Fruit a papery, bladder-like, three-lobed pod, nearly 2′ long. Found in thickets from Quebec to Minnesota and southward.

MAPLE (*Acer L.*)

A group of large trees valuable for timber and for use as shade trees; familiar to every one and greatly admired for the beauty of their foliage. The leaves are large and broad, opposite on the twigs, conspicuously lobed, generally toothed, with large veins branching from the petiole. The bark is gray to brown, smooth, scaly or ridged. In one form the leaves are composed of 3-5 leaflets. The flowers are small, reddish or yellow-green, in loose or close clusters. The fruit has a blade-like outgrowth or wing.

Key to the Maples.

Leaf compound. 1. Boxelder.
Leaf not compound.
  Sinus (space between lobes) rounded.
    Sinus broad, lobes short. 2. Sugar Maple.
    Sinus narrow, lobes long. 3. Silver Maple.
  Sinus (space between lobes) sharp angled.
    Bark grayish, becoming scaly.
      Twigs reddish. 4. Red Maple.
      Twigs brownish. 3. Silver Maple.
    Bark brownish or red-gray, smooth.
      Bark not striped. 5. Mt. Maple.
      Bark striped with white or black. 6. Striped Maple.

1. **Boxelder Ash-leaved Maple** (*A. Negundo L.*). A small tree rarely 50° high, with short trunk and stout, spreading, often drooping branches. Twigs greenish to purple and often covered with a whitish coating. Bark smooth, grayish brown, becoming cracked into deep, firm ridges, rarely scaly. Leaves composed of 3-7 (usually 3) ovate to obovate leaflets,

usually coarsely toothed and sometimes lobed, 2′-5′ long. Flowers and fruit in long, drooping clusters.

Found from Vermont to southern Ontario and southward throughout our range. A handsome tree, extensively cultivated in many forms and colors.

2. **Sugar Maple** (*A. saccharum Marsh.*). A tree of 40°-100° with ascending, regularly dividing branches forming a symmetrical ovoid top. Twigs smooth, green, soon reddish brown or orange brown.

Bark smooth, light brown, becoming brown-gray on old trunks and cracked into coarse scales or vertical broken plates. Leaves heart-shaped at base, 3-5 lobed (mostly 5), the lobes with 3-5 roundish teeth, light to dark green above, paler and often hairy on veins beneath; in the fall passing through shades of red, purple, and yellow, 3′-6′ long. Flowers cover the tree in spring in yellow, lacy clusters. Wings of fruit 0.5′-1′ long, parallel or slightly spreading. Prefers hilly country. Found from eastern Canada to Manitoba and southward. Perhaps the most extensively cultivated native tree in the East and the principal source of maple sugar. Several forms are recognized, notably the Black Maple (*A. nigrum Michx.*) which has in its extreme form yellowish twigs, scaly, dark brown or almost black bark, and leaves commonly three-lobed, hairy beneath and toothless.

The Norway Maple (*A. platanoides L.*) introduced from Europe, is much cultivated and occasionally escapes. Bark brown, cracking into a network of shallow ridges. Leaves larger than Sugar Maple, juice milky (break petiole). Flowers in conspicuous, flat, yellow clusters. Fruit with wings at right angles, 2′ long.

3. **Silver Maple** (*A. saccharinum L.*). A graceful tree, usually with short trunk and stout, ascending and dividing branches; the branchlets often drooping and

curving upwards at their tips. Twigs smooth, green, soon becoming brown, often tinged with red, unpleasant odor when bruised. Bark smooth, gray, cracking on old trunks into thin, somewhat curved scales of gray-brown color. Leaves usually with five deep lobes, silvery white beneath (hairy when young), teeth irregular, 3′-6′ long. Flowers appear before leaves in close bunches on the twigs, greenish yellow or reddish. Fruit with large, spreading wings, 1′-2′ long. Found on river banks and bottom lands from New Brunswick to southern Ontario and eastern Dakota southward. Much cultivated, though the branches are easily broken by snows and winds.

4. **Red Maple** (*A. rubrum L.*). A tree 40°-80° high with strong, ascending branches forming an ovoid top. Twigs smooth, green, soon shining, light or dark red. Bark grayish, smooth, becoming, on old trunks,

ridged and covered with long, plate-like scales of a dark, gray-brown color. Leaves with three broad lobes, and usually with two small lobes at base, irregularly double-toothed, light or dark green above, paler

or whitish beneath, sometimes hairy, 2′-6′ long. Flowers deep red or slightly yellow, covering the twigs in the spring before the leaves appear. This tree leads the red procession in the spring and in the fall. Fruit small, about 1′ long. Found in wet soils from Nova Scotia to western Ontario and southward.

The Carolina Maple (*A. Carolinianum Britt.*) is a similar tree, ranging from Massachusetts to southern Illinois southward. Leaves usually three-lobed, few toothed, whitish and usually hairy beneath.

5. **Mountain Maple** (*A. spicatum Lam.*). A bushy little tree generally found in clumps on the margin or in the openings of rather moist woods, especially along streams. Twigs slightly hairy, yellow-green to reddish, becoming smooth and red-brown. Bark smoothish,

dark gray or reddish brown, often mottled, and on old trunks sometimes slightly ridged. Leaves thin, with 3-5 short lobes and coarse teeth, downy on veins beneath, 3′-6′ long. Flowers appear after leaves in long, erect, hairy clusters. Fruit in bright red or yellow drooping clusters, becoming brown. Found from eastern Canada to Manitoba and south to Minnesota, Michigan, Ohio, and along the mountains to Tennessee.

6. **Striped Maple** (*A pennsylvanicum L.*). A shrub or small forest tree, rarely exceeding 30°, with short trunk and straight, slender branches. Twigs smooth, yellow-green, sometimes mottled with black, becoming red-brown and often white streaked. Bark smooth,

reddish brown or dark green, white- or black-striped, becoming dark brownish gray and somewhat cracked on old trunks. Leaves very thin, roundish, with three short lobes above the middle (hence the name "goose-foot"), nearly smooth (hairy when young), fine-toothed, 4′-8′ long. Flowers and fruit in long drooping clusters. Found in rich woods from Nova Scotia through Quebec and Ontario to Minnesota and southward along the mountains to Tennessee.

The Sycamore Maple (*A. Pseudoplatanus L.*) is a much cultivated tree that occasionally escapes. Twigs smooth, shining, yellow-green or light brown. Bark smooth, brown or gray, cracking into short, flat scales on old trunks, Leaves usually firm, with three rounded lobes and coarse, blunt teeth, deep green above, paler and hairy on veins beneath, 4′-8′ broad. Fruit in large, drooping clusters.

HORSECHESTNUT, BUCKEYE (*Æsculus L.*)

Trees with stout twigs, large scaly buds, and rough bark. Leaves large, opposite, composed of 3-9 leaflets radiating from the petiole, veins running straight to leaf margin. Flowers pale yellow, white or red, in large, erect, showy clusters. Fruit roundish, leathery, smooth or prickly; contains one or more smooth, shining, brownish nuts with whitish spot ("buck's eye") on one side.

Key to the Buckeyes.

Fruit prickly.
  Leaf coarsely toothed. 1. Horsechestnut.
  Leaf fine-toothed. 2. Ohio Buckeye.
Fruit smooth.
  Bark scaly. 3. Yellow Buckeye.
  Bark smooth. 4. Red Buckeye.

1. **Horsechestnut** (*A. Hippocastanum L.*). An introduced tree extensively cultivated in many varieties.

Twigs smooth, reddish brown with sticky winter buds; bark smooth, dark brown, cracking on old trunks into flat, irregular, scaly plates. Leaves composed of 5-7 (usually 7) wedge-shaped leaflets, abruptly narrowed at tip, coarsely toothed, 4′-8′ long. Flowers white with red or yellow spots, in large pyramidal clusters. Fruit prickly, about 1.5′ broad, containing one or more shining, brown-red nuts.

2. **Ohio Buckeye** (*A. glabra Willd.*). A medium-sized tree with fine hairy, orange-brown twigs, becoming smooth, reddish brown or gray; ill-smelling when crushed; buds not sticky. Bark gray, cracking into coarse plates. Leaves composed of 5 (rarely 7) elliptical leaflets, irregularly fine-toothed, hairy on middle vein beneath, 4′-8′ long. Flowers pale greenish yellow. Fruit as in No. 1. Found in moist soil from western Pennsylvania to Illinois and Nebraska southward. A related form (*A. arguta Buckl.*) has 6-9 lanceolate leaflets with very sharp teeth.

3. **Yellow Buckeye** (*A. octandra Marsh.*). A large forest tree (sometimes shrubby). Twigs as in No. 2.

Bark light or dark brown, cracking into irregular, thin scales. Leaves as in No. 2, but sometimes obovate with fine regular teeth, 4′-10′ long. Flowers yellowish, rarely pinkish. Fruit smooth. Range from western Pennsylvania to southern Iowa and southward.

4. **Red Buckeye** (*A. pavia L.*). Usually a shrub with smooth, gray or brown bark. Leaflets commonly 5, elliptical to obovate, fine-toothed, shining, 2′-6′ long. Flowers red. Fruit smooth. Found in woods and along streams from Virginia, Kentucky, and Missouri southward.

CAROLINA BUCKTHORN (*Rhamnus caroliniana Walt.*)

A tall shrub or small tree with slender branchlets, at first fine-hairy, light brown, with reddish tinge, becoming smooth and gray. Bark smooth, ash-gray, often black-blotched. Leaves elliptical, faintly toothed or smooth margined, 2′-5′ long. Flowers minute, in

small, hairy clusters. Fruit roundish, changing from red to black, sweet, 0.4′ broad. Found in swamps, on river banks and hillsides from New Jersey to Kansas southward.

The Common Buckthorn (*R. cathartica L.*) has been used for hedges and is now established in many places, especially in the East. It is a shrubby plant, sometimes 30° high with crooked branches often spiny. Bark smooth, dark brown, cracking into thin strips and finally becoming ridged. Fruit black and bitter.

JERSEY-TEA (*Ceanothus americanus L.*)

One of our most attractive shrubs, rarely exceeding 20° in height. Twigs yellow-green. Bark smooth and brown. Leaves ovate to broad-lanceolate, thin, three-veined from petiole, toothed, 1′-4′ long. Flowers

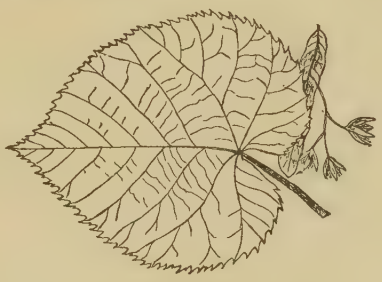
showy, white, in lacy clusters. Fruit roundish, three-lobed. The leaves remain green until late in the fall. This plant was used in Revolutionary times as a substitute for tea. It is found in dry, open woods from Maine to western Ontario and southward.

LINDEN. BASSWOOD (*Tilia L.*)

These are mostly large trees with grayish, ridged bark, inner bark tough and fibrous, juice mucilaginous. The foliage is attractive; leaves large and broad with base mostly heart-shaped and unequal, teeth coarse. The flowers are fragrant, creamy or white in flattish, showy clusters, drooping on a long stem from an oblong leaflet. Fruit a roundish, hairy nutlet. Valuable timber trees, much cultivated in many varieties.

1. American Linden. Basswood (*T. americana L.*). A large forest tree with numerous slender branches forming a rounded or ovoid top. Twigs greenish, nearly smooth, becoming reddish gray or

brown. Bark smooth, brownish gray, cracking on old trunks into deep, firm, flat ridges. Leaves thick and firm, broadly ovate or roundish, generally unevenly heart-shaped at the base, hairy in angles of veins be-



neath, teeth coarse and sharp, 3′-6′ long. The leaflet of the flower cluster is oblong and very short-stemmed. Found in rich woods from eastern Canada through southern Quebec and Ontario to Manitoba and southward.

2. **Beetree Linden. White Basswood** (*T. heterophylla Vent.*). Resembles the American Linden but is somewhat smaller. Recognized by its longer leaves

(5′-8′) which are white- or gray-hairy beneath. The leaflet of the flower cluster has a decided stem. Found mostly in mountain woods on limestone soils, from southern New York to Indiana and Illinois southward.

3. **Gray Linden** (*T. Michauxii Nutt.*). A beautiful tree with broadly ridged dark bark and silvery gray branches. The leaves are usually smaller than those of the other Lindens, 2′-6′ long, bright green and shining above, densely gray or silvery hairy beneath. Found along waterways from southern New York to Ohio and southward.

HERCULES CLUB (*Aralia spinosa L.*)

A shrub or small tree with stout, wide-spreading branches. Twigs stout and brown, bark smooth, becoming a coarse network of firm ridges; the entire plant armed with hard, slightly curved prickles. The

enormous leaves (2°-4° long) are composed of numerous ovate leaflets, toothed, dark green above, pale beneath, 1′-4′ long. Flowers minute, white, arranged in huge, branching clusters, 2°-4° long. Fruit a small, blackish berry. Found in moist woodlands from southern New York to Indiana and southward.

TUPELO. SOUR OR BLACK GUM
(*Nyssa sylvatica Marsh.*)

A large tree, 30°-100° high, with straight trunk and small, usually strikingly horizontal branches. Twigs generally smooth, greenish yellow becoming grayish or red-brown. Bark smooth, grayish; becoming scaly

reddish brown to dark gray-brown; and on old trunks broken into deep, coarse blocks or irregular, short ridges. Leaves ovate to obovate, narrow-pointed, margins smooth or rarely with a few teeth, usually shining and dark green, 2′-5′ long; strikingly colored in the fall. Flowers minute, greenish, in small clusters. The pollen and seed-producing flowers on separate trees. Fruit berry-like, 1-3 on a long stalk, dark-blue. Usually found on wet or moist soils, from southern Maine to Ontario westward to Michigan and Illinois and southward.

The Water Gum (*N. biflora Walt.*) grows in marshes from New Jersey southward. The trunk is greatly swollen at the base; the leaves narrower, blunter and more leathery than in the Tupelo.

FLOWERING DOGWOOD (*Cornus florida L.*)

A small flat-topped tree familiar to all who love the spring woods. Twigs smooth, purplish green, becoming grayish and bent upward at tip. Bark smooth, light brown or red-gray becoming darker or nearly

black and broken into irregular, squarish blocks Leaves opposite, elliptical to ovate, slightly hairy, margin sometimes wavy or roughened, pale or sometimes whitish below, 2′-7′ long. Flowers minute, greenish, in showy clusters, 3′-4′ broad; the outer part of the cluster consists of four white or pink obovate leaflets, notched at the end and about 2′ long. Fruit a scarlet berry (rarely yellowish). Found in open forests from southern Maine to Ontario and Minnesota and southward. This tree needs your earnest effort to save it from destruction. The automobile has made it the prey of every town and city.

Roughleaf Dogwood (*C. asperifolia Michx.*). A small, narrow-topped tree, or more often a shrub. Twigs slender, hairy, light yellow-green, becoming gray- or red-brown. Bark smooth, dark brown with tinge of red, cracking on old stems into irregular, shallow, scaly ridges. Leaves elliptical to oblong, usu-

ally tapering to a sharp point, rough above, somewhat hairy beneath (very hairy when young), 2′-6′ long. Flowers small, in cream-white, flattish clusters. Fruit white. Found in moist soil, from southern Ontario to Minnesota and southward.

The Silky Dogwood (*C. Amomum Mill.*) is common throughout our area. Twigs purplish; bark on old stems yellow-brown; the under surface of leaves silky-downy, often rusty. Fruit pale blue.

The Pagoda Dogwood (*C. alternifolia Michx.*). An odd but attractive shrub or small tree; its whorled branches widely separated, producing a pagoda-like appearance. Twigs smooth, yellow or purplish green,

becoming dark green, often white- or gray-striped. Bark smooth, reddish brown, breaking on old stems into firm, rather oblong scales or plates. Leaves alternate (rarely opposite), ovate, sometimes slightly toothed, whitish beneath, 2′-4′ long. Flowers in flat, white clusters. Fruit bluish black. Found on borders of forests and in open fields, from Nova Scotia to Quebec, Ontario and Minnesota southward.

SUMMERSWEET CLETHRA (*Clethra alnifolia L.*)

An attractive shrub or small tree with slender, mostly erect stems. Twigs slightly hairy, light brown, becoming on old stems smooth, dull brown. Leaves thin, obovate, strongly narrowed at base, sharply fine-toothed towards tip, 1′-3′ long. Flowers appear in

mid-summer, small, white or pinkish, in erect and usually branching clusters, spicy odor. Fruit a small, smooth pod. Found in wet soils from Maine southward along the Atlantic States.

The Cinnamon Clethra (*C. acuminata Michx.*) is a similar plant found in the Alleghanies from Virginia southward. Bark smooth, light reddish brown, cracking into thin scales. Leaves ovate to oblong, rounded or slightly narrowed at base, 3′-8′ long. Flower-clusters somewhat drooping. Fruit-pods roughish.

ROSEBAY. RHODODENDRON (*Rhododendron maximum L.*)

A small shrubby tree (rarely 40° high and often only 10°-15°) with very crooked stems and branches. The dense thickets of these plants, with their shining deep green foliage and showy flowers

present an attraction rarely equalled. Twigs green with tinge of red, becoming smooth, green and finally red-brown or gray. Bark smooth, cracking on old stems into small, thin, red-brown scales. Leaves remain on trees for 2-3 years; they are elliptical to obovate, leathery, 4′-10′ long, pale or whitish beneath (hairy when young). Flowers in large, close clusters, pink to white. Fruit a brown ovate pod about 0.5′ long. Found in rocky woods, along streams and swamps, from Nova Scotia to southern Quebec and Ontario and southward along the mountains. Cultivated in many forms.

MOUNTAIN LAUREL (*Kalmia latifolia L.*)

A shrub or small tree with crooked stems and branches. Few plants add more beauty to the open woods at all seasons of the year. Twigs at first sticky-hairy becoming smooth, shining green, and finally red-brown. Bark on old stems cracks into long, narrow,

red-brown scales. Leaves clustered at ends of twigs, sometimes 2-3 at the same level on the twig, falling off after one or two years; leathery, smooth, dull green when mature, elliptical to obovate, 2′-5′ long. Flowers white to pink, about 1′ broad, in large, flat clusters. Fruit a small, roundish pod about 0.2′ broad. Prefers rocky woods. Found from New Brunswick to Ontario and Indiana and southward. This plant is being exterminated in many places by the thoughtless use of it for decoration.

SOURWOOD (*Oxydendrum arboreum DC.*)

A tree 20°-50° high with straight, slender stem and spreading branches, forming a rather narrow top. Twigs smooth, yellow-green, changing to orange or

red-brown. Bark smooth, gray-brown, cracking on old trunks into short, broken, rounded ridges. Leaves elliptical to oblong, narrow-tipped, with fine incurved teeth. Smooth and shining, acid to taste, scarlet in the

fall, 4′-8′ long. Flowers small, white, in long, drooping and branching, one-sided clusters. Fruit a small, ovoid woody pod. Found from Pennsylvania and Indiana southward, especially along the mountains.

FARKLEBERRY (*Vaccinium arboreum Marsh.*)

A shrub or small tree with short, crooked stem and branches. Twigs slender, hairy, light red-brown be-

coming smooth and dark red. Bark smooth, red-brown; cracking into long, thin scales. Leaves leath-

ery, obovate to elliptical, teeth minute or lacking, nearly smooth, shining dark green, 0.5′ to 2′ long. Flowers small, white, clustered on leafy twigs. Fruit a small berry, shining black, sweet. Found in moist soils from southern Illinois and Indiana to North Carolina and southward. This tree belongs to that large group of shrubs called Blueberries and also Huckleberries.

WOOLLY BUMELIA (*Bumelia languinosa Pers.*)

A small tree or shrub (rarely exceeding 50°), sometimes with spiny branchlets. Twigs very rusty or pale-hairy becoming smooth, reddish brown or gray; cut twigs exude a gummy juice. Bark dark gray-

brown, cracking on old stems into a network of firm ridges. Leaves clustered on short stems, leathery, obovate, rounded at tip, rusty or white hairy beneath, 1′-3′ long. Flowers small, white, in dense clusters. Fruit cherry-like, black, about 0.5′ broad. Found in woods from southern Illinois and Kansas southward.

Buckthorn Bumelia (*B. lycioides Pers.*). A similar tree but smaller, with slightly hairy twigs and smooth grayish bark that cracks into thin scales; on old trunks may become slightly ridged. Leaves firm,

elliptical to oblanceolate, with sharp tips, nearly smooth, 2′-6′ long. Found in borders of swamps and streams from southern Illinois and Indiana southward.

PERSIMMON (*Diospyros virginiana L.*)

A slender tree with spreading branches forming a narrow or broad rounded top. Twigs hairy greenish, becoming gray or red-brown. Bark smooth, dark reddish brown, cracking into thick, squarish blocks.

Leaves ovate to elliptical, firm, nearly smooth, shining dark green, 2′-6′ long. Flowers small, greenish yellow, solitary or few-clustered; the pollen and seed-bearing flowers usually on separate trees. Fruit yellowish when ripe, sweet, usually not edible until after frost, 0.5′-2′ broad. Our cultivated Japanese varieties have larger fruits. Found in woods and old sandy fields from Connecticut and southern Iowa and southward.

GREAT SILVERBELL (*Helesia caroliniana L.*)

A beautiful shrub or small tree with stout ascending and spreading branches. Twigs hairy, usually soon smooth and yellow-brown. Bark smooth, reddish brown, cracking into shallow ridges separated by yel-

lowish furrows; on old trunks broken into broad, flat, scaly ridges. Leaves elliptical to obovate, teeth minute, deep green above, paler and often hairy beneath, 2′-7′

long. Flowers white, about 0.5′ long, in drooping clusters. Fruit oblong, four-winged, usually over 1′ long. Found on banks of streams from Virginia to Illinois and southward. Much cultivated.

COMMON SWEETLEAF (*Symplocos tinctoria L'Her.*)

A shrub or small tree with slender upright branches forming an open top. Twigs green, usually hairy, becoming smooth, brownish or grayish. Bark gray,

smooth, finally developing short, roughened cracks, separated by broad, flat spaces. Leaves elliptical to obovate, teeth indistinct, shining dark green above, slightly hairy beneath, with sweetish taste, 3′-6′ long. Found in rich woods from Delaware southward and in the Blue Ridge from North Carolina southward.

ASH (*Fraxinus L.*)

These valuable timber trees grow for the most part in moist or swampy ground. The branchlets are stout, with oppositely placed coarse and blunt twigs. Bark grayish, ridged or scaly. Leaves large, opposite, and composed of 5-11 leaflets. Flowers, appearing in early spring, very small, in branching clusters, and of two kinds; each kind usually on different trees. The pollen-bearing flowers are in very dense clusters and red-purple, becoming yellowish when the pollen is shedding. The seed-forming clusters are more branching, and the minute flowers develop into hard, cylindrical or flattened, one-seeded pods that spread out into a paddle-shaped wing. The leaves of the Ashes are exceedingly variable, but the winged fruits are more reliable guides to the various forms.

Key to the Ashes.

Leaflets without petioles. 1. Black Ash.
Leaflets with petioles.
  Twigs square. 2. Blue Ash.
  Twigs rounded.
    Twigs smooth or nearly so. 3. White Ash.
    Twigs hairy or velvety.
      Trees of very wet swamps. 4. Pumpkin Ash.
      Trees of drier soils.
        Wing at tip of seed pod. 5. Biltmore Ash.
        Wing extending down side of seed pod. 6. Red Ash.

1. **Black or Hoop Ash** (*F. nigra Marsh.*). A tall slender tree of swamps. Twigs soon smooth, greenish, becoming gray or with tinge of yellow. Bark gray, rough-warted, cracking on old trunks into large ir-

regular plates covered with thin, soft scales. Leaves 12′-16′ long, composed of 7-11 oblong, narrow-pointed leaflets, toothed, very nearly smooth (rusty hairy be-

neath when young), 3′-5′ long, without petioles. Fruit with oblong wing extending around the flat seed portion. Found from eastern Canada to Manitoba, southward to Delaware and Arkansas.

2. **Blue Ash** (*F. quadrangulata Michx.*). A valuable western timber tree. Twigs squarish, rusty hairy, reddish or orange colored, becoming brownish or grayish. Bark smooth, gray tinged with red, crack-

ing on old stems into irregular, thick plates covered by thin, small scales, often shaggy. Leaflets usually 7 (7-11) sharp-toothed, nearly or quite smooth, 3′-5′ long. Fruit with oblong wing, rounded or notched at tip, and forming a narrow margin around the flattened seed portion. Found in dry or moist woods from southern Ontario and Minnesota southward to eastern Tennessee and Arkansas.

3. **White Ash** (*F. americana L.*) A large and valuable forest tree with massive, straight trunk and large ascending branches. Twigs greenish, often with tinge of orange or red, becoming light brown or gray, and polished. Bark dark gray or brown (inner bark

of branches green or tan), cracking into a regular network of deep, firm ridges. Leaves 6′-12′ long, composed of 5-9 ovate or lanceolate-oblong leaflets with smooth or fine-toothed margins, light or dark green above, paler or silvery and often lightly hairy on veins beneath, 2′-6′ long; petiole smooth. Fruit in long branched clusters; the wing lanceolate or oblong-lanceolate, blunt tipped and attached to the end of the cylindrical seed portion. Common in rich, moist soils from Minnesota to Lake Superior southward and eastward.

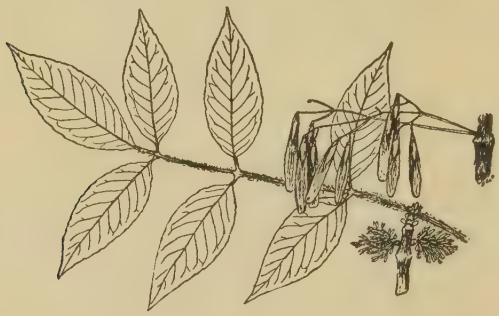
4. **Pumpkin Ash** (*F. profunda Bush.*). A tall slender tree with greatly enlarged base (pumpkin) growing in deep swamps that are often covered with water for months at a time. Twigs light gray and usually hairy. Bark gray, cracking into broad, shal-

low, scaly ridges. Leaves 9′-18′ long, with 7 or 9 leaflets, resembling the White Ash though more hairy. Fruit with narrow, oblong wing, rounded (often notched at tip), and extending nearly to the base of the slightly flattened seed portion. Found from western New York to southern Illinois and southward.

5. **Biltmore Ash** (*F. biltmoreana Beadl.*). A tree resembling the White Ash but with very hairy twigs and petioles. Bark dark gray and cracked into a less pronounced network of narrow ridges. Fruit with narrow, oblong wing. Found on banks of streams from western New Jersey along the Appalachians to Alabama.

6. **Red Ash** (*F. pennsylvanica Marsh.*). A tree usually smaller than the White Ash but resembling it in many respects. It is found in moister soils, as low river banks and borders of swamps. Twigs greenish gray and usually velvety, becoming light gray or brown.

Bark smooth, gray or brown (the inner bark of branches reddish) becoming cracked into shallower and flatter ridges. Leaflets hairy or downy beneath.



Fruit with wing extending to at least the middle of the cylindrical seed portion, and gradually broadening above it into a rounded or notched or slightly pointed tip. Range from eastern Canada to Manitoba southward.

The Green Ash (*var. lanceolata Sarg.*) appears in some sections as a distinct form of the Red Ash, with smooth twigs, leaflets long, narrow pointed and sharp toothed above middle. Found from Maine and the St. Lawrence valley to Saskatchewan and southward.

TEXAS ADELIA. SWAMP PRIVET

(*Foresteria acuminata Poir.*)

A shrub or small tree with spreading and sometimes thorny branches. Bark dull brown, smooth, becoming slightly roughened or ridged. Leaves opposite, elliptical, tapering at both ends, faintly toothed,

smooth, 1′-4′ long. Flowers yellow green, in small clusters before the leaves appear. Fruit oblong, bluish, cherry-like, about 1′ long. Found on borders of streams and swamps from southern Indiana and Illinois southward.

WHITE FRINGETREE (*Chionanthus virginiana L.*)

A beautiful shrub or small tree of rocky soils and river banks. Twigs green, usually hairy, becoming smooth, light brown or orange colored. Bark smooth, reddish brown, cracking into irregular scales or sometimes ridged. Leaves opposite, elliptical to obovate, margins wavy, shining above, hairy beneath on veins,

2′-8′ long. Flowers fragrant in graceful, drooping, snow-white clusters 4′-8′ long. Fruit cherry-like, 1′

long, dark blue or black. Found from southern New Jersey and Pennsylvania southward. Often cultivated.

EUROPEAN PRIVET (*Ligustrum vulgare L.*)

A shrub or small tree much used for hedges. Escaping from Maine to Ontario and southward. Cultivated in many varieties. Leaves opposite, elliptical,

leathery, smooth, deep green, 0.5′-2′ long. Flowers small, white, in compact, erect clusters. Fruit berry-like, black.

COMMON CATALPA (*Catalpa bignonioides Walt.*)

A widely cultivated tree with short, often crooked trunk and widely spreading coarse branches. Twigs reddish purple becoming gray to reddish brown. Bark thin, smooth, light reddish brown, cracking on old trunks into irregular thin scales. Leaves with un-

pleasant odor, opposite or whorled, ovate or heart-shaped, short pointed, sometimes lobed, somewhat hairy beneath, 4′-10′ long. Flowers white, thickly blotched with yellow or brown, about 2′ long; in spreading, erect, many-flowered clusters, 6′-10′ long. Fruit long slim pods, changing from green to brown, on trees all winter; seed with two fringed wings.

The Western Catalpa (*C. speciosa Engle.*) is a large forest tree with tall, straight trunk and slender branches. Bark thick, reddish brown, cracking into flat scaly ridges. Leaves long, narrow-pointed. Flowers white, slightly blotched at base; in erect, few-flowered clusters. Fruit as in common Catalpa. Occurs from southern Indiana and Illinois southward.

Royal Paulownia (*Paulownia tomentosa Bail.*). A much cultivated tree from Japan, strongly resembling the Common Catalpa. Twigs hairy, becoming smooth, brown. Bark smooth, light to dark brown, cracking into shallow, irregular, smooth, flat ridges. Leaves more hairy beneath. Flowers violet, in erect clusters often a foot long. Fruit a leathery pod about 2′ long. Found from New York and New Jersey southward.

COMMON BUTTONBUSH (*Cephalanthus occidentalis L.*)

A shrub or small tree with spreading crooked branches forming a round, bushy top. Twigs often whorled, light green, changing to reddish brown. Bark smooth, brownish, becoming darker on old stems and

cracked into narrow, loose scales. Leaves opposite or whorled, ovate to lanceolate, deep green, smooth, 2′-8′ long. Flowers small, fragrant, creamy white, in rounded clusters. Fruit in greenish or brownish balls about 0.7′ broad. Found in swamps and along streams from New Brunswick to Nebraska southward.

AMERICAN ELDER (*Sambucus canadensis L.*)

A shrubby plant of common occurrence in open fields throughout our range. Twigs thick but soft, greenish, becoming light brown with purplish tinge. Bark smooth, dark brown with small warts, becoming

scaly on old stems. Leaves have unpleasant odor when crushed; they are opposite, composed of 5-11 leaflets, ovate to oblong and fine-toothed. Flowers small, white, in large flat clusters, 3′-10′ broad. Fruit a small, purplish black, sweetish berry.

The Red Elder (*S. racemosa L.*) has hairy twigs and leaves; flowers in ovoid clusters; fruit bright red. Found in open, rocky woods. There are also several cultivated forms.

VIBURNUM (*Virburnum L.*)

A large and widely distributed group of shrubby plants, only four of which may be called tree-like. They are found under widely different conditions; such as open woods or dense thickets, dry hills or wet swamps. Attractive in foliage, flower and fruit; cultivated in many varieties. The Snowball tree or Guelder Rose is an example. Leaves opposite, usually toothed, and without lobes in the tree forms. Flowers small, white, in broad, flat clusters. Fruit cherry-like, often bluish.

Key to the Viburnums.

Leaf sharp-toothed.
  Leaf long, narrow-pointed. 1. Nannyberry.
  Leaf blunt or short-pointed.
    Leaf smooth or nearly so. 2. Blackhaw.
    Leaf red-hairy beneath. 3. Southern Blackhaw.
Leaf toothless or nearly so. 4. Smooth Witherod.

1. **Nannyberry** (*V. Lentago L.*). A shrub or small tree with short trunk and slender, drooping branches forming a rounded, bushy top. Twigs foul-smelling when bruised, greenish, slightly rusty hairy, becoming scurfy, light red, and finally smooth red-brown. Bark dark reddish brown, broken on old stems into small, thick plates. Leaves ovate to obovate, taper-pointed, fine-toothed, at first rusty hairy, becoming smooth, shining, 2′-4′ long. The leaves at the tips of the twigs usually have petiole with minute wings. Fruit blue-black, sweet. Found in borders of forests, in moist ground, from Quebec to Manitoba and southward.

2. **Blackhaw** (*V. prunifolium L.*). A shrub or small tree usually with crooked stem and stiff spreading branches often bearing spine-like twigs. Twigs at first nearly smooth and reddish, soon turning green

and finally reddish gray or brown. Bark smooth, red or gray brown, breaking on old stems into irregular, thick, rounded or squarish plates. Leaves elliptical to obovate, usually blunt or short-pointed, fine-toothed, smooth, dark green, 1′-3′ long. Fruit blue-black, sweet. Found on dry hills and along fences from Connecticut to Michigan and Kansas and southward.

3. **Southern Blackhaw** (*V. rufidulum Raf.*). Resembles the Blackhaw but the young twigs are rusty

hairy, as are the under surfaces of the leathery leaves and their winged petioles. Leaf 3′-4′ long.

4. **Smooth Withe-rod** (*V. nudum L.*). A shrub or small tree with nearly horizontal branches. Twigs at first scurfy, soon becoming smooth, shining, red-brown, and finally greenish brown. Bark reddish brown and broken on old stems into irregular, thick plates. Leaves elliptical to obovate, blunt or short-pointed, margins sometimes wavy or faintly toothed, thick, shining and smooth above, slightly scurfy on veins beneath (very scurfy when young), 3′-8′ long. Flowers white, in flat or curved clusters 2′-4′ broad. Fruit pink to deep blue. Found in swamps and moist, rich soil, from Connecticut to Kentucky and southward.

The Withe-rod (*V. cassinoides L.*) is a shrub similar to the above species but with slender, ascending branches. Twigs scurfy, light brown or gray; leaves smaller (1′-4′ long), ovate to elliptical, duller above. Found in swamps and wet soils, from Newfoundland to Manitoba and southward.

There are several common shrubby Viburnums easily recognized by their leaves, as: 1. The Mapleleaf Viburnum (*V. acerifolium L.*) of rocky, open woods, with Maple-like leaves, soft, downy beneath (see No. 4, page 162; 2. The Cranberry-bush (*V. Opulus L.*), found along water ways, with deeply 3-5 lobed, smooth leaves, fruit red, sour, used as cranberries; 3. The Hobblebush (*V. alnifolium Marsh.*) found in moist woods, with rounded leaves heart-shaped at base, rusty hairy on veins beneath, 4′-8′ broad, the branches often nearly horizontal and touching the ground; 4. The Arrow-wood (*V. dentatum L.*) erect, tall shrubs of wet soil, leaves broadly ovate to rounded, smooth, strongly veined, regular sharp teeth, 2′-3′ long. The Indians

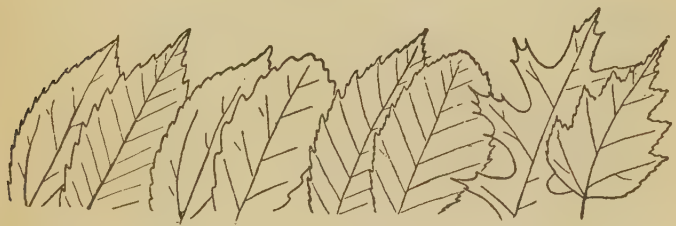
used the straight branches for arrow shafts; 5. The Downy Viburnum (*V. pubescens Pursh.*) a low straggling shrub of rocky woods, with leaves resembling the Arrow-wood but downy beneath and with less prominent veins and teeth.

DEFINITIONS

FORMS OF LEAVES

Lanceolate. Oblanceolate. Ovate. Obovate. Oblong. Elliptical.

LEAF MARGINS



Sharp-Toothed. Blunt-Toothed. Double-Toothed. Lobed.

ALTERNATE. A term applied to the arrangement of leaves, twigs, etc., that are scattered singly along a stem but never opposite each other.

AROMATIC. Having a sweetish pleasant odor.

BARK. The outer covering of a stem or branch.

BLADE. The flat part of a leaf.

BLOTCHED. Having irregular spots.

BRANCH. One of the large divisions formed by the forking of the stem of a tree.

BRANCHLET. A small branch.

COMPOUND. A term applied to a leaf that is made up of several leaflets.
CONE. A dry fruit with overlapping scales covering the seed.
CYLINDRICAL. Resembling a cylinder, having nearly uniform diameter.

ELLIPTICAL. With the outline of an ellipse (see fig. above).

FELTY. Having closely interwoven hairs.
FIBROUS. Having a thread-like structure.
FLEXIBLE. Easily bent without breaking.
FRUIT. Any structure that contains the seed.

GLAND. A cell or group of cells producing various substances, as resin, gum, water, etc.
GLANDULAR. Having glands.
GRANULAR. Composed of grains or particles.

HYBRID. A cross between two species or varieties of plants.

LANCEOLATE. Lance-shaped (see fig. above).
LEAFLET. One of the small leaves of a compound leaf.
LOBE. A large projection of a leaf margin (see fig. above).

MARGIN. The edge of the leaf blade.
MATURE. Full grown.
MOTTLED. Marked with spots of different colors.
MUCILAGINOUS. Resembling mucilage, slimy or gummy.

OBLANCEOLATE. Inverted lance-shaped (see fig. above).
OBLONG. Longer than broad, with rounded ends and nearly parallel sides (see fig. above).
OBOVATE. Egg-shaped in outline, broadest towards the tip (see fig. above).
OPPOSITE. A term applied to a pair of leaves placed opposite each other on the twig.
OVATE. Egg-shaped in outline, broadest toward the base (see fig. above).
OVOID. Applied to a body that is egg-shaped.

PENDULOUS. More or less hanging or drooping.
PETIOLE. The stem of a leaf.
PITH. The small, central, soft part of a branch or twig.
POLLEN. The dust-like particles (cells) produced in certain parts of the flower.
POD. In this book, a term applied to any thin or dry structure holding the seed.
PRICKLE. A small spine-like outgrowth.
PYRAMIDAL. Tapering to a point, pyramid-like.

RAVINE. A deep narrow gorge, usually formed by a stream.
RESIN. The thick, sticky (usually aromatic) juice of certain trees.
RESINOUS. Containing resin.

SCALE. One of the small, thin, leaf-like coverings of a bud, usually brownish; also applied to thicker flat structures of a cone, and to the flakes of bark.
SCURFY. Having very small, thin, bran-like scales.
SHRUB. A small woody plant with several stems branching from the same root.
SINUS. The space between two lobes.
SPECIES. A term applied to a group of plants that are essentially alike.
SPINE. A sharp-pointed, woody outgrowth.
STIPULE. A small leaflet or scale at base of petiole.

TEETH. The small projections on the margin of the leaf.
THORN. A stiff, sharp-pointed, woody projection.
TREE. A woody plant with one large stem.
TRUNK. The main stem of the tree.
TWIG. A small branchlet.

VEINS. The fine lines (usually branching) seen in a leaf.

WAND-LIKE. Resembling a long, slender rod.
WHORL. The arrangement of three or more leaves or twigs in a circle around a stem or branch.
WOOLLY. Covered with long tangled hairs.

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